HANDBOOK
OF THE
NETHERLANDS EAST-INDIES

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HANDBOOK

OF THE

NETHERLANDS EAST-INDIES

DIVISION OF COMMERCE OF THE DEPARTMENT OF AGRICULTURE, INDUSTRY AND COMMERCE, JAVA
(BUITENZORG)

PREFACE

A revision of the editions published as "Yearbook of the Dutch East Indies" in 1916 and 1920 by the Division of Commerce of the Department of Agriculture, Industry and Commerce at Buitenzorg, now comes out under the title of "Handbook of the Netherlands East=Indies".

This modified title has been chosen for the new edition, because it better answers the purpose and nature of the book.

A "Yearbook" is supposed to be an annual edition or anyway one, which appears at regular periods, in which a continued, chronological, historical summary is given of the events, which confine the social, economical and political development of the country concerned during the succeeding periodse

A "Yearbook" therefore is of more interest to those, who know the country well and for those who have chosen the country as a subject of scientific study.

The object of this book, however, is to give a general review of the actual substance of the Colony and its importance for the world traffic.

Therefore the book takes the form of a concise monographic description, for which the indication "Handbook" is more suitable.

The general propagandistic character of the edition decided the avoidance and limitation of statistical cipher=schedules, whilst only those subjects have been treated, which are considered to be of greater importance. This also explains why in this book much space is given especially to the economical matters. For the same reason this "Handbook", which is only published in English, does not appear in Dutch, as was the case with both former editions of the "Yearbook", but instead of that, an abbreviated revision in French and Swedish translation, have been published.

Division of Commerce of the
Department of Agriculture, Industry and Commerce.
Buitenzorg (Java).

1923

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Foreign equivalents of the principal weights, measures and coins in the Dutch East Indies.

WEIGHTS

1 K. G. = 2,2046 lbs
1 Ton = 1.000 K. G. = 2204,62 lbs
1 Picul = 100 katties = 61,76 K. G. = 136 lbs a.d.p.

MEASURES

1 Metre (m.) = 39,37 inches.
1 Kilometer (K.M.) = 1093 Engl. yards = 0,6214 miles
1 Hectare (H.A.) = 2,47104 acres
1 Bahoe = 7096.49 M^2. = 1,7537 acres
1 Hectolitre (H.L.) = 100 L. = 22 Imperial gallons.

COINS

1 Guilder = 1 s. 8 d. = $ 0.40

GEOGRAPHICAL DESCRIPTION

Location, general topography, soil

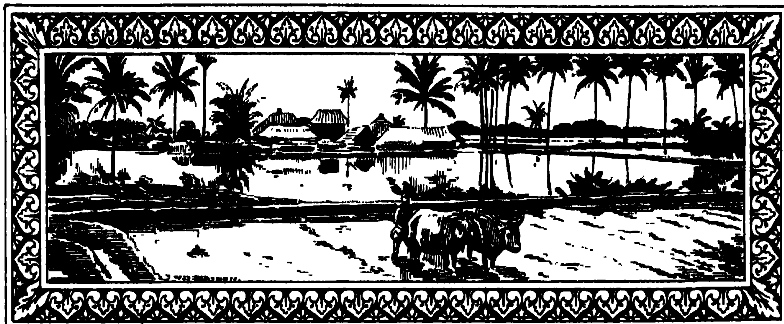
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Flora

Fauna

Population

Colonization



CHAPTER I.

LOCATION, GENERAL TOPOGRAPHY, SOIL.



he Dutch East Indies, the great island empire, situated between Australia and South Eastern Asia, extend between 95° and 141° E. L. from Greenwich, and between 6° N. L. and 11° S. L., thus over 5.000 K. M. from East to West, and almost 2.000 K.M. from North to South. The journey by sea from Sabang, north of Sumatra to Merauke, in New Guinea, covers about 3.000 nautical miles, thus more than the distance from England to America.

The largest islands are Java with Madura, Sumatra, Borneo, Celebes, New Guinea; Borneo and New Guinea are only partly Dutch. These countries cover an area:

		about as large as:
Java with Madura,	131.508 K.M^2.	the State of New York.
Sumatra with adjacent islands,	420.384 „	California.
Borneo (the whole island),	736.500 „	Cape Colony.
Dutch Borneo,	553.341 „	France.
Celebes with adjacent islands,	185.914 „	New Zealand and Ceylon.
Dutch New Guinea,	397.204 „	Japan.

Besides these are innumerable smaller islands, such as the so called Little Sunda Islands, the Moluccas, etc, so that the total land area amounts to almost 2.000.000 K.M^2. i.e. about as big as half of Europe without Russia.

All these islands have a central mountain region, more or less extensive coastal plains and between these a hill-land, generally not very wide.

The mountain region (over 600 M. elevation) in Java consists



A MOUNTAIN LAKE

entirely of young volcanic rocks, which disintigrate rapidly in the warm, humid climate and thereby provide much plant food. By this means the mountain land is covered with rich soil on which, to an elevation of about 1.500 M., are found beautiful plantations, and from here up to the summits, at about 3.000 M., are found luxuriant primeval forests. Where the mountain region is deprived of its forests and not utilized by the so called mountain cultures: coffee, tea, cinchona, or European vegetables, we find great prairies, intersected with thin, low shrubs.

The hill=land presents a very different appearance, all depending on the composition of the soil. If it must be classified with the above named young volcanic formations, we find here in Java hardly a single spot that is not in use; what is not occupied by sawahs (irrigated ricefields) is used for dry farming, or is planted with fruit trees and other useful plants. Of the crops may be mentioned, next to tea and coffee, first of all rubber, then cassava, peanuts, tobacco and corn. As far as the hill=land in Java consists of tertiary marls and limestone, it bears little else than extensive teak forests.

The alluvial lowlands in Java are almost entirely taken up by agriculture, in the first place for the growing of rice, further for sugar=cane, corn, tobacco, cassava, sweet potatoes, peanuts, coconut palms, kapok trees, some indigo and finally native vegetables and fruit.

In the regions which have been under cultivation for a long time, the fer= tility of the soil is by no means to=day as great as it once was, and as it still is in stretches just cleared. Intensive agriculture is no longer possible here with= out suitable manuring.

In the plains the fertility is still kept up to the proper standard by a highly developed system of irrigation.

On the other islands — in contrast with the highly cultivated and densely populated Java and Madura —, called the Outer Districts, we generally find much less land under regular cultivation. On a percentage basis, however, commercial crops, such as Deli tobacco, rubber and tea, preponderate, as do coconut palms and, on account of less intensive irrigation, rice growing on non=irrigated fields. A great many primeval forests and extensive poor grass lands are still found in the hill=lands as well as in the plains.

Since the central mountain regions of Sumatra, Borneo, Celebes and New Guinea — apart from smaller areas, which are built up from the same kind of fertile, young volcanic material as Java's mountain lands — for the greater part consist of less fertile, primary rock (granite and old slate) the soil of the Outer Districts in general, is not as rich as that of Java, being even as poor as similar parts of Middle Africa and South America, which explains why more primeval forests are found there, and a much sparser population.

Between the lowlands and the coastline, especially along the Eastside of Sumatra and along almost the entire coast of Borneo, a tract of swamps is found which attains in some parts a surprising extension and which is almost entirely covered with mangrove=vegetation.



PALACE OF THE GOVERNOR GENERAL

The strongly developed coastline with a number of good natural harbours and suitable road-steads on quiet, navigable inlets and beaches, create favourable chances for shipping and trade.

Already in times of old, this was active between the islands themselves, and between them and the Southern and Eastern countries of the Asiatic continent, with Malacca as the great trade center, just as Singapore, Batavia, Samarang, Sourabaya and Macassar are to-day.

Moreover, the location of the Netherlands Indian Archipelago between world oceans with a vast deal of navigation may be considered especially favourable for a world traffic. The opening of the Suez Canal has greatly increased the ocean traffic with Europe, while the excavation of the isthmus of Panama has again opened up new fields for navigation.

Trade is no more concerned exclusively with the products of agriculture, but also with those of mining.

The primary rockformations in the Outer Districts produce tin, gold and silver; the contactzones with younger eruptive rocks produce copper, lead and zinc, while platinum and diamonds are found in Borneo in secondary deposits.

The tertiary shales and sandstone, found on almost all the large islands, contain huge quantities of young coal, lignite and oil.

In Celebes and adjacent smaller islands great quantities of iron ore containing nickel were recently found. Only tin, coal, gold and oil are at present intensively worked.

CLIMATE.

As the difference between the longest and the shortest day is about 48 minutes, the duration of the sun's irradiation in the D. E. I. is very uniform and therefore the difference in temperature is not great.

The daily variations in temperature are therefore less here than on the tropical continents. This favourable condition is due to the influence of the sea, which tempers the heat by day and the cooling off at night.

On the coast the average temperature is from about 26 to 27 degrees C., the absolute maximum temperature from about 34 to 37 degrees C. and the average maximum temperature from about 30 to 32 degrees C. In Holland during the summer months, there is sometimes a temperature of from 34 to 35 degrees C. The absolute and average temperature minima on the coast are from about 16 to 22 and from 21 to 24 degrees C. With an increase in altitude the temperature is seen to decrease about $^1/_2$ degree C. per 100 M.

The atmospheric pressure is also very even. Slight fluctuations are observed daily, but depressions such as are encountered in the temperate zones are unknown. Occasionally in the regions farthest from the equator cyclonic



SQUARE BEFORE TE RESIDENCE OF A RAJAH

disturbances occur. Heavy continuous winds are practically unknown, but locally, over a region of small extent, heavy showers and sudden storms occur now and then, which can be very powerful.

The winds are the regular alternating monsoon and trade winds; the period of change being marked by the inconstancy of the winds and by thunderstorms.

South of the equator it is the West Monsoon usually, which brings the rain, while the East Monsoon brings the dry season. Taken as a whole the rainfall is considerable, but is much influenced by the height and direction of the mountain chains.

The period with the least rainfall is from May to August inclusive, and that of the greatest from November to January inclusive.

The tropical oceanic climate, with its regular temperature, calm atmosphere, great moisture and heavy rains, which prevent the formation of steppes and savannas, is most conducive to the growth of tropical plants of agricultural value.

Only on some of the islands in the south-eastern part of the Archipelago we find a perfectly dry season with the accompanying withering of vegetation.

The excessive rainfall in the highlands is a favourable factor for the irrigation of the high plains.

The Indian climate varies considerably from year to year. The difference between the monsoons is sometimes greater, sometimes less, so that in Java, for instance, in some years there is no real dry season, while in other years not a drop of rain falls for months at a time.

FLORA.

On account of the warm, damp climate, the vegetation is very exuberant, especially in the Western parts of the Archipelago and New Guinea. Where the land is not yet cultivated, from the sea shore to the mountain summits, everywhere more or less dense primeval forests are to be found.

These forests have an almost similar appearance; strong variations of the general type generally appear only along the coast and on the higher mountain tops. Along the low coasts the mangrove plants form a narrow forest strip, which presents a most remarkable appearance on account of the many arched adventitious roots on which the Rhizophora plants rest. As an instance of the peculiar way, in which some plants in these regions adapt themselves to their surroundings, may be particularly cited, those whose fruits germinate still hanging on the trees, the hypocotyles, the seed roots of which sometimes attain a length of two feet before the fruits drop (Rhizophora, Bruguiera, Aegiceras), and those whose respiratory roots lift their tops perpendicularly from the swamps (Sonneratia, Avicennia). Much of the vegetation indigenous here, is



CRAT THE TANGKOEBAN AHO

particularly adapted for dispersal by the fact that their fruits are carried away by sea currents (Cocos, Nipah, Pandanus, Barringtonia, Cerbera, Terminalia, etc.).

On the summits of the highest mountains and also in the vicinity of craters, brushwood and shrubs take the place of the timber forests. In these cool regions, although not everywhere at the same altitude, the branches of the trees are covered with thick cushions and long festoons of mosses and lichens. On the damp, less elevated mountain tops of Ambon and also of other islands the thin trunks are changed into green pillars by an unusually thick coat of moss.

Unlike the forests in the temperate zones, the tropical virgin forest is for the greater part composed of a large number of tree-species, many of which attain a height of from 40 to 50 metres (120 to 150 feet) or even more. A result of this is, that the latter exhibits much more variety of species in a small area than the former. Nevertheless on account of its polymorphic composition, even when situated in regions far afield, they give an almost uniform impression.

Forests where one species of trees predominates are rare. A notable exception is the forest of teak trees (Tectona grandis L.), the valuable wood of which is spoken of elsewhere. Especially in the dry monsoon, when the trees are quite leafless and the parasites, as Viscum and Loranthus, appear as large, thick nests on the branches, but also when they are covered with young leaves or when the huge grey flowerplumes lift themselves above the big leaves, these forests make a striking impression.

Another species, surely no less remarkable, is the tjemara (Casuarina montana Jungh.), forming forests on the mountains of East Java, which strongly remind us of pine forests. In Sumatra another species of this genus (Casuarina Sumatrana De Vr.) together with a real pine (Pinus Merkusii De Vr.) also form woods.

In the higher mountains the woods mainly consist of Vaccinium species (wood berries) and the Javanese „Edelweiss" (Anaphalis Javanica) and other mountain plants. There are also various plants belonging to families which are common in the temperate zones (violets, buttercups, valerian etc.).

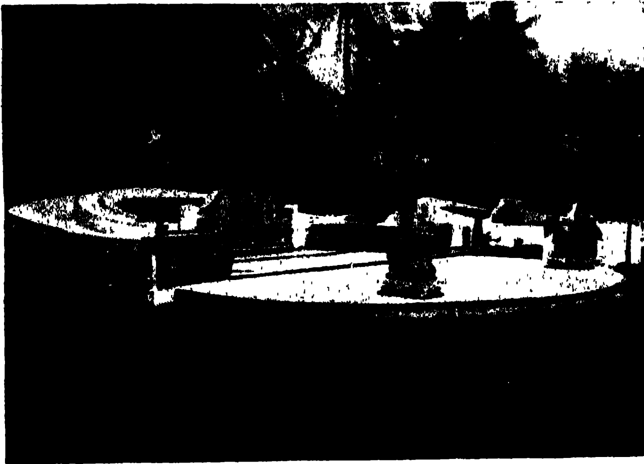
In several of the eastern islands are found sparse, shadowless, monotonous woods of Melaleuca Leucadendron L., of which one variety produces the kajuput oil. The soil of these woods is covered with grass.

The picturesque and useful bamboo here and there, as in East-Java, covers whole mountainslopes. Bamboo groves give a deep shade; the ground is covered with a thick layer of fallen leaves, and is a favorite place for saprophytes.

Palms are also found everywhere, but owing to their scattered growth, generally contribute little to the average character of the virgin forests. Particularly remarkable, however, are some woods, on account of the occurrence of the gebang palm (Corypha Gebanga Bl.) growing at some distance from the sea, especially along the south coast of West Java. This is one of the biggest species of fanpalms. When the trunk is fullgrown it develops an enormous inflorescence at the top. The palm dies after the ripening of the fruit. On sandy

coasts, especially on many of the smaller islands, large numbers of coconut palms (Cocos nucifera L.) grow, which are also extensively cultivated, and in swampy places on the seashore, especially along the mouths of brackish rivers, the nipah (Nipah fruticans Thb.) often grows along the banks.

Very conspicuous in the tropics is the surprising wealth of climbing plants (lianes), epiphytes and parasites. These climbers, which belong to the most varied families, are equipped in all kind of ways, in order to cling to other objects and to climb up, so that they may seek the light, necessary to their development. There are some which twist themselves around the supporting trunks, others attach themselves to the supporting tree by means of aerial roots. Others again make use of variously shaped tendrils to get a firm hold. Some have branches which differ from ordinary branches, having the capacity of winding themselves around any smaller object, distending and hardening afterwards, whereby an almost inseparable connection is formed.



CHINESE GRAVE

Prickles or thorns often form excellent climbing organs, most perfected in the rottan (Calamus, etc.).

Epiphytes play a most important part in these regions. Representatives of this group are found in several families, but most of them belong to the orchids, ferns and mosses, which often cover big trees from the bottom to the top. Most species are found in the humid mountain regions, while in the highest mountains, especially near the seacoast, they only occur in limited numbers. However, in this regard no general rule can be established. The seacoast of Java and the surrounding small islands are exceedingly poor in epiphytic orchids, while on the contrary in the Moluccas, for example in Ambon, many are found on the trees along the coast, even on the branches overhanging the sea.

It is a remarkable fact that orchids do not grow equally well on all sorts of trees. Sometimes trees are found growing next to each other, of which one is entirely covered with them, while on the other they are entirely lacking. As a rule these plants grow easily on mango (Mangifera), kambodja (Plumiera), coffee, but on the contrary they rarely grow on djeungdjing (Albizzia), dadap (Erythrina), njamplung (Calophyllum), mindi (Melia) etc. The smoothness

of the bark has nothing to do with this, since the smooth trunks of palms are sometimes entirely covered with epiphytical orchids.

Not only herbs live like epiphytes on the trees, but also shrubs and even trees are often found living high above the ground. Some species of Ficus are especially interesting in this respect. The young plants which have germinated from seeds, dropped by fruit-eating birds on the branches, live at first exactly as epiphytes. But later on the long, downward growing, interlacing roots reach the ground, forming a network around the trunk of the supporting tree. They continue to increase in number and thickness until the supporting tree is strangled and the Ficus stands by itself on a trunk entirely consisting of roots.

Parasites of the Loranthaceae family are found everywhere in enormous quantities, among them some with the most brilliantly coloured flowers. More remarkable still are the Rafflesias, whose gigantic flowers appear on the lower parts of the stems of wild vines. Even among trees, parasites are found, among others, the sandalwood (Tjendana).

Where the forests have been cleared and the new vegetation is constantly burnt down, a wilderness of high grass (alang-alang and glagah) usually takes their place.

Densely populated districts, such as the lowlands of Java, give the foreign travellers an impression of forests, interpersed with ricefields. In reality they are, what Junghuhn calls „village groves", i.e. villages quite hidden behind the foliage of fruit trees and other plants which have sprung up occasionally or which have been planted without any regular order.

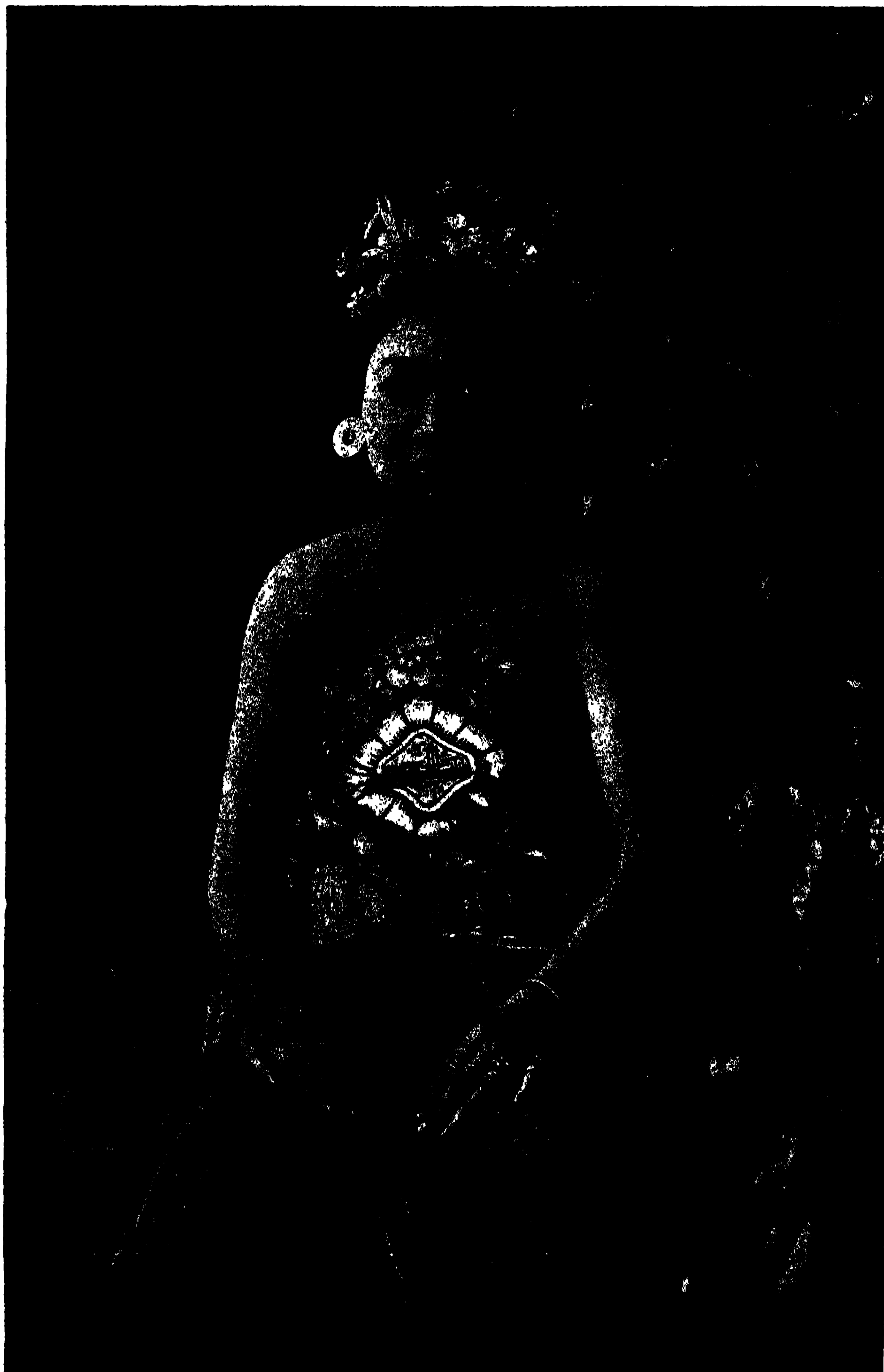
One often hears that India is poor in flowers. Certainly in inhabited regions, on meadowland, along roadsides, etc., the number of conspicuous flowers is very small in comparison with Europe, and those found, are for the greater part imported and run wild here. Even in the real jungle the flowering plants are seldom conspicuous, still there are many pretty flowers and coloured fruits and beautifully marked leaves contributing to the decoration of the woods. Borneo is particularly rich in plants with coloured leaves, much more so than Java or the eastern part of the Archipelago.

FAUNA.

The Malay Archipelago, situated between Australia and the Asiatic continent, possesses a fauna, the type of which belongs to both these regions.

With respect to its fauna, Australia differs very sharply from all other regions, it has very special forms of the Monotremata (duckbill and ant-eater) and the marsupials, which are found in South America, but not in Asia. This region is further characterized by the absence of the higher mammals.

Tropical Asia, the oriental region, on the other hand is rich in placental mammals, but is much less a sharply defined whole than the Australian terri-



By courtesy of C. Nieuwenhuis, Padang

BALINESE WOMAN

tory. It has many types in common with Africa, for instance the lemurs, which are also abundant in Madagascar.

To the oriental region also belong Malacca, which is still linked to the continent, and the great Sunda islands: Sumatra, Java and Borneo.

The fauna of New Guinea with the Aru islands exhibits a pure Australian character.

The intervening islands, Celebes, the Moluccas and the Timor Archipelago, form a transitional region.

A sharp division between Oriental and Australian regions such as marked by Wallace, which boundary ran between Celebes and Borneo and between Bali and Lombok, does not exist, because the two regions gradually overlap each other.

Sumatra, Borneo and Java.

The fauna of these three islands, much resembles that of Malacca, but each island also has its own peculiar types. Java is more isolated, has been longer separated from both the other islands, while interchange of species after the separation became more difficult than between Borneo and Sumatra.

Borneo has many animals in common with Sumatra, but only with the flat lowlands of the East Coast; the West Coast of Sumatra, with the adjacent islands (Nias, Engano), especially as regards the insect world, form more one whole with Java.

Thus the orang-outang is common to both Sumatra and Borneo, but is not met with in Java, while on the other hand the tiger is found in Sumatra and Java, but not in Borneo.

The siamang (Hylobates syndactylus) is found only in Sumatra, while the longnosed ape (Nasalis larvatus) is never found outside Borneo.

The number of ape species, which the continent of Asia shares with the large Sunda Islands, is greatest in Sumatra, less in Borneo and still less in Java.

Foxnosed monkeys (Tarsius) are known in Sumatra, Borneo and Celebes, but not in Asia. Common to both South east Asia and the great Sunda Islands is another lemur, the Slow Loris (Nycticebus), while still another pair of remarkable insect-eaters, the tupai (Tupaja) and the flying maki (Geleopithecus) are peculiar to this region.

The wild ox (banteng or Bos Sundaicus) is also found in Indo-China and Malacca but, strange to say, seems to be lacking in Sumatra.

The kerbau is a tamed buffalo (Bos bubalus), which belongs to India. Of the deer, characteristic to this region, the kanchil or dwarf deer (Tragulus) and the kidang or muntjac (Cervulus muntjac) should only be mentioned.

Among the pachyderms, tropical Asia has the elephant and the tapir in common with Borneo and Sumatra, the first has allies in Africa, the latter only in South America. Both animals are unknown in Java, but here are found the rhinoceros, the onehorned Rhinoceros Sundaicus, while Malacca, Borneo and



OLD BATAVIA. HOUSES OF THE 18TH. CENTURY

Sumatra have a species of their own (Rhinoceros Sumatrensis) with two horns.

Hedgehogs and moles are unknown in this region, but shrews of the genus Crocidura are common as far as Celebes.

As to the birdlife the three great islands are quite similar to South East Asia.

Some peculiar species should be mentioned, such as the argus pheasant (Argusianus argus), known in Sumatra and Malacca.

The peacock is found from India and Ceylon to Java, also the original form of the domestic fowl, the bankiva chicken (Gallus ferrugineus) makes its home here. Parrots are very scarce in this region, in contrast with the eastern part of the Archipelago, where they are found in abundance.

Celebes, the Moluccas and the Timor Archipelago.

These islands form the transitional region to the Australian territory. Bali still has a great number of birds in common with Java, birds which are already lacking in Lombok, where for the first time we find the cockatoo.

Starting from Java, the number of Javanese birds on the islands of the Timor Archipelago decreases steadily, while the number of Australian species increases. The Australian species, however, are much more changed here than the Javanese, the separation from Australia having taken place at a much earlier date; a deep sea separates Timor from Australia.

In Timor we come across a marsupial, the cuscus (Phalanger orientalis) but not yet the kangaroo.

Timor and Batjan form the eastern boundary of the propagating territory for monkeys; till here the monyet is found (Macacus cynomolgus). As far as Timor the cat tribe is also found represented here by a particular species, Felis megalotis, which except on this island is only found in Rotti.

From the point of view of its fauna, Celebes is the most remarkable land of the Archipelago. It has many species, which are entirely peculiar to itself and lacking in the surrounding territory, while allies appear in far distant stretches such as Europe and Africa. It also has few forms in common with Borneo, which tends to ascribe a great age to the Strait of Macassar.

Only in North Celebes and Batjan we find Cynopithecus niger, which is akin to the African baboon. Confined to Celebes, also, is the remarkable Anoa, the dwarf buffalo and the deerhog (Babirussa), which lives also on the nearby Sulu Archipelago and in Buru.

Of the Australian types some species of the cuscus have penetrated as far as Celebes, while of the Oriental types Macacus, Tarsius, Paradoxurus and Russa are still found.

Many varieties of parrots are also found, most of which are indigenous here. The remarkable racquettailed parrot (Prioniturus) is also known in the Philippines. In Celebes the Coracias temmincki occurs, which species is not further met with in the Oriental region, though common to West Asia, Europe



EXTERIOR OF CHINESE TEMPLE

and Africa. Scissirostrum is a species which is found here and which is allied to the oxpecker (Buphaga) of tropical Africa.

The doves of Celebes resemble those of Timor, the Philippines and New Guinea. Typical also of this island is the helmeted maleo, Megacephalon maleo, of the Megapodii breed, big, longlegged fowls of New Guinea and Australia.

If the Oriental types are already few in Celebes, they are still less in the Moluccas. Monkeys are entirely lacking here, we find only the shrew, also rats, which belong to the same species as those of Australia, New Guinea, Celebes and the Philippines.

The hog as well as the civit cat have probably been imported.

The number of marsupials is greater here than in Celebes, while the Moluccas are the most profuse territory for birds that we know of. A third part of the birdlife is represented by parrots, kingfishers and doves, which are related to those of New Guinea but have developed a type of their own. Here are also many Megapodiides, while in Ceram we also find the helmeted cassowary (Casuarius galeatus), allies of which live in New Guinea.

Many insect groups have reached here their highest stage of development, among the butterflies for instance, the gorgeous Ornithoptera.

New Guinea with Aroo Islands.

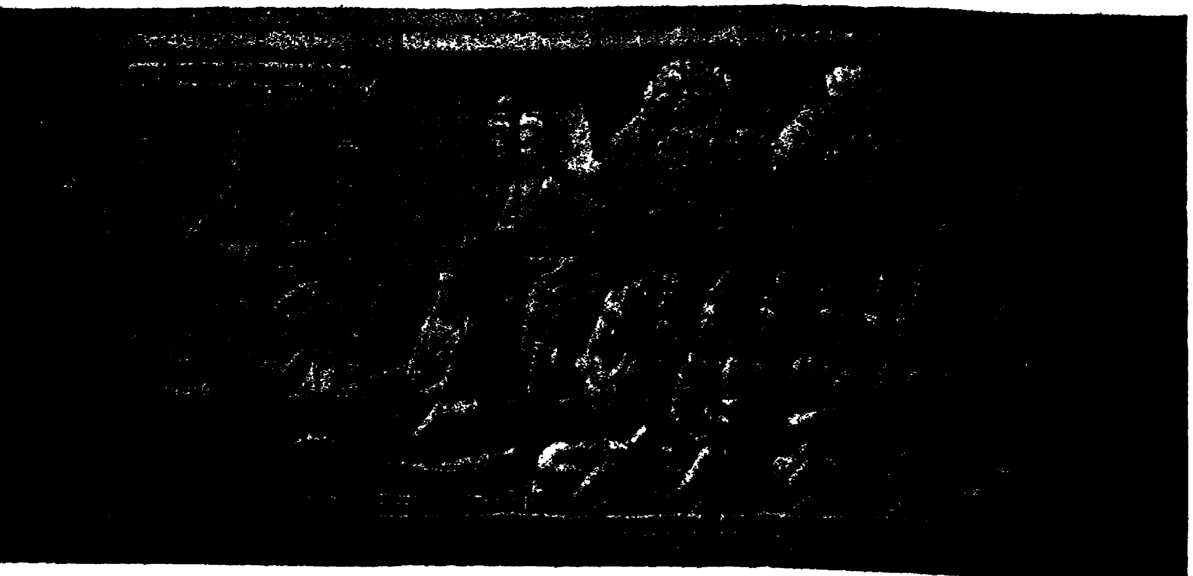
These islands are purely Australian in character. They are remarkable for their great number of marsupials, while genuine kangaroos are also found. Here also the Australian anteaters are quite common. New Guinea is also pre-eminently the home of parrots and birds of paradise, while beautiful kingfishers, and many doves, amongst which the crown pigeon, are found.

Nearly all these birds are related to those of Australia, but some Oriental types are also common here.

Pheasants, vultures, woodpeckers and junglefowl are entirely lacking, as in Australia.

Among the insects, the many horned flies and the shieldbearing locusts (Phyllophorinae) are especially remarkable, while many typical Australian species are also found.

That the fauna of New Guinea has so much in common with that of Australia is the more remarkable, when we consider how greatly the two regions differ both in climate and vegetation.



RELIEF OF THE BOROBUDUR TEMPLE. MID JAVA.

POPULATION.

The native population of the Archipelago belongs to the Malay-Polynesian and Papuan races.

The various groups of population differ considerably as to their development, history, political status and purity of race.

Already in the first centuries of our era, part of the Archipelago (chiefly Java and Sumatra) was visited by merchants from Hindustan, who remained for a shorter or longer time in this country.

The groups of people who have intermarried with these Hindus, such as the Javanese and the Malays of Sumatra, are in general the most highly civilized.

In the Archipelago, as elsewhere, a close connection is seen between the regular or irregular pursuit of agriculture and the stage of development attained by the people.

To the established agriculturists belong the Javanese, Sundanese and Madurese in Java, the Balinese in Bali, and the Gajus, Achenees, Bataks, Menangkabaus and Palembangs in Sumatra.

The Dayaks in Borneo, the Toradjas in Central Celebes and the inhabitants of the Moluccas live a semi-nomadic life. They cultivate forest tracts, cleared by fire, which are vacated after one or more harvests. Next to rice, sago is their most important food.

To the most primitive groups of people, who live on such animal and vegetable food as nature provides and who are known as the hunting and fishing tribes, belong the Papuans of New Guinea and some groups in Sumatra and Borneo.

Of the chief races the following deserve mention:

The Malays, in a narrow sense, are found distributed throughout the whole Archipelago, but especially in Malacca, Sumatra and the surrounding islands. The Malays from the coast regions have developed chiefly into merchants. They are more intelligent and active than are most of the races of the interior, over whom they have attained an economical supremacy. The Malay tribes of the interior of Sumatra are characterized by their unwillingness to work. The women are the most industrious and do the housework as well as the field labour. In many districts matriarchy prevails.

Resembling these Malays from the coast are the Macassarese and the Bugis, who inhabit the eastern part of the Archipelago, and the Madurese who, for the most part, live by fishing and navigation.

The Javanese contrast favourably with the other people, both by their orderliness and their willingness to work. Outside of Java they are employed as labourers in Sumatra, the Straits Settlements and the West Indies. They are strongly attached to their surroundings and do not readily leave their homes, which tends to retard their emigration. But now that considerable colonies of Javanese are found outside of Java, they are more ready to go away to a new environment. Labour for the European agricultural estates is chief-

ly supplied by the Javanese. In the Outer districts, however, also many Chinese may be found.

According to the census of 1905 it appeared that 71% of the inhabitants of Java, who pursue an occupation, belong to the farming class. The number of tradesmen and artisans was only about 5% and 4% respectively.

Foreigners in the Dutch East-Indies.

For centuries many foreigners have settled in the Archipelago, besides Europeans principally Chinese and Arabs. Their number is also great at the present time.

The Chinese are found chiefly in Java, on the East Coast of Sumatra, in Borneo and in Banka. They are principally merchants, while many are tradesmen and gardeners. Most of them belong to the middle classes and carry on a retail trade, but many, by their diligence and economy, have grown rich and become proprietors of large commercial concerns, estates and factories.

The European trade is in the main wholesale, being supplemented by the intermediary trade of the Chinese.

In the Western Division of Borneo the Chinese have accomplished a great deal towards the advancement of agriculture.

On Sumatra's East Coast contract coolies are imported from China for labour in the tobacco fields and on rubber-estates. A considerable number of the Chinese living in these parts, now work as free labourers, small farmers and merchants. Thousands also find a means of livelihood in fishing and wood-cutting.

Chinese labourers are also found in great numbers in the tin-mines of Banka and Billiton and in the coal- and gold-mines of Sumatra.

The number of Arabs has increased since the opening of the Suez Canal. For the most part they are retail dealers, while part of them are coast navigators. The fact that they come from the country, sacred to the Mohammedans, gives them a certain prestige among the natives.

At the end of 1920, there were about 170.000 Europeans in the Dutch East Indies. They are for the most part officials, merchants, managers and employees. It is due to their activity, capital, knowledge, energy and capacity for organisation, that the Dutch East-Indies have become a producing country of importance.

According to the latest census held in 1920, the number of inhabitants at the end of 1920, was:

in Java and Madura	34.984.171
in the Outer Districts	14.366.663
Total	49.350.834

In the following table is a review showing the numbers of Europeans, Foreign Orientals and Natives and their distribution over Java and Madura and the Outer Districts, according to the census held in 1905, 1917 and 1920. As will be seen, the population of the D. E. I. is still gradually increasing.

	EUROPEANS			NATIVES		
	1905	1917	1920	1905	1917	1920
Total Java and Madura	64.917	111.430	135.288	29.978.567	33.652.230	34.433.476
Total Outer Districts	16.138	26.924	34.420	7.375.004	12.526.287	13.871.144
Grand total	81.055	138.354	169.708	37.353.571	46.178.517	48.304.620

FOREIGN ORIENTALS			TOTAL		
1905	1917	1920	1905	1917	1920
317.183	393.723	415.407	30.360.667	34.157.383	34.984.171
318.973	440.461	461.099	7.710.115	12.993.672	14.366.663
636.156	834.184	876.506	38.070.782	47.151.055	49.350.834

NUMBER OF INHABITANTS OF SOME OF THE LARGE CITIES OF THE DUTCH EAST-INDIES

TOWN	EUROPEANS	FOREIGN ORIENTALS	NATIVES	TOTAL	TIME
Batavia	24.540	42.441	186.837	253.818	ult. 1920
Sourabaya	17.497	26.282	148.411	192.190	"
Samarang	10.151	21.257	126.628	158.036	"
Bandung	9.043	6.740	79.017	94.800	"
Surakarta	2.441	8.839	123.005	134.285	"
Djokjakarta	3.730	5.727	94.254	103.711	"
Medan	3.128	18.297	23.823	45.248	"
Macassar	2.742	9.371	44.605	56.718	"

COLONIZATION.

In 1904 it was decided to make a trial with the transportation of families from the thickly populated Java to the thinly populated sections of the Outer Districts.

Gedong Tataän in the Residency of the Lampong Districts was selected as the home for the first colony. The intention was to drain overpopulated Java, to promote greater development of some of the territory in the Outer Districts and to provide for the needs of labour on the large agricultural estates there. It has however appeared in practice, that colonization is of

little use as a medium to check overpopulation and to provide for the needs of labour.

The colony at Gedong Tataän turned out to be a success.

At the end of 1922 it consisted of 5.532 families and 19.554 souls. In 1921 a second colony was established at Kota Agung in the same district. Also for this district there is no difficulty in inducing Javanese to settle down there.

After a few difficult years, the colonists finally make a good living in their new home.

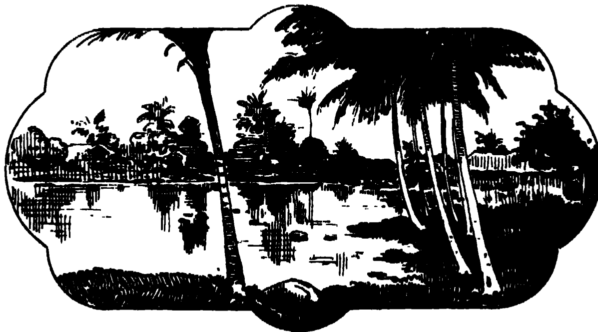
It was found very desirable to have European supervision in these new colonies. Every effort is made to make the colonists defray the expenses of the colonization. What they require for their needs in the beginning is loaned to them by the Lampong Provincial Bank.

In view of the present conditions of affairs it was decided not to give any further Government support to this colonization scheme. For this reason a trial of colonization in the South and East District of Borneo was suspended.

In the Residency of Benkulen there are two small settlements of especially Sundanese colonists. On the East Coast of Sumatra there is also an opening for colonists.

These colonies are however of little importance at present. Government efforts to encourage migration in Java had hardly any success.

The spontaneous migration from the overpopulated districts of Java to the Residency of Besuki is however very considerable. Slowly the still wild parts of this district are being opened up by Javanese from Mid Java and brought into cultivation.



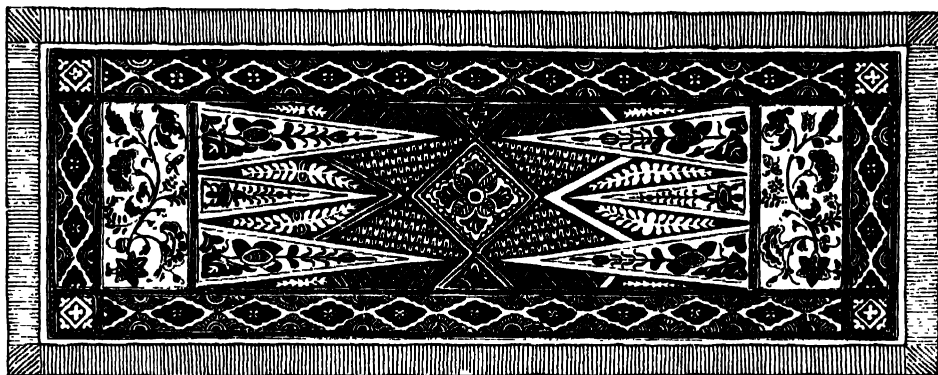
LEGISLATION, ADMINISTRATION AND LEGAL SYSTEM.

Government.

Self-governing communities.

Provincial and municipal government.

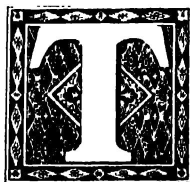
The legal system.



CHAPTER II

GOVERNMENT.

1. *Political relation of the Dutch East Indies to the Netherlands.*

he Dutch East Indies form politically a part of the Kingdom of the Netherlands.

Regulations of a legislative nature may be made by the Netherlands legislature, by Royal decree and by ordinance of the Governor-General in conformity with the Council of the D. E. Indies.

The Netherlands legislature is the highest legislative authority; it is expressly charged with the regulation of some affairs concerning the Indies and it may regulate other matters if, according to its opinion, the necessity should arise. Practically however it restricts its interference to laws of general constitutional importance and laws influencing economic life, such as tariff laws, taxes, loans, mining regulations, important concessions and the annual budget bills.

Autonomy has been granted to a certain degree to the Indies, for which the name „Colony" has been abolished; the name of „oversea territory" was adopted instead. As soon as the necessary by-laws will come into force, the legislative powers of the Crown and of the Governor-General in Council will be transferred for the greater part to the D. E. Indian legislature, which is formed by the representative body and the Governor-General.

By act of December 16 1916, a representative body (Volksraad, i. e. People's Council) was established. The first session was opened May 18 1918.

Up till now its powers are advisory only. It consists of 49 members; the Speaker is appointed by the Crown. Of the other members 24 (12 Natives,



VIEW OF MOUNTAIN VILLAGE NEAR TOSARI. (EAST JAVA).

12 Europeans and Foreign Orientals) are elected by the members of the Local Councils and 24 (8 Natives, 16 Europeans and Foreign Orientals) are appointed by the Governor-General.

The sessions are as a rule public; the Dutch and the Malay languages are both allowed for the discussions. The views of the Government are explained to the „Volksraad" by the Directors of the Departments and other Agents.

Yearly the budget is fixed provisionally by the Governor-General in accordance with the advice of the „Volksraad": the Dutch parliament however is charged with the definitive fixing and in many cases deviates from the provisionally fixed budget.

The supreme control over the executive power is vested in the Crown; the Governor-General rules in the name of the Queen. In his legislative as well as in his executive functions, he is assisted by an official advisory body, the Council of the D.E. Indies, and by the Heads of the Departments of General Administration, who together form a separate Council of Department Heads. Also the Governor-General disposes of a bureau of general control, the General Secretariat.



THE TOMORI ROCK (CELEBES).

A General Board of Auditors supervises the Government expenditure and generally the enforcement of the legislation on financial subjects.

2. *System of administration and training of civil servants.*

For administration in a narrower sense, the Dutch East Indies are now divided into 36 provinces, viz. 3 Governments, 32 Residencies and 1 Independent sub-residency.

The highest functionary in the provinces is a head official with the title of Governor or Resident, who represents the Central Government. His task is not the same in all provinces. The system of administration in Java and Madura presents, except in the Principalities (Surakarta and Djokjakarta), a different aspect from those in the Outer Districts, where, besides the central authority, we also find a Native ruler.

In the regions under direct control of the Government, the Residents



REL OF TH BOROBUDUR MID AVA

act as direct rulers, but in the selfgoverning communities their task is limited to supervision and the giving of advice and assistance.

Where they act as rulers in the Outer Districts, their independence as a rule is greater than in Java, because of the more isolated location and the more primitive conditions.

Since the decentralization of administration was introduced in 1903, the task of the Residents in Java and Madura has been partly transferred to provincial and municipal councils, which have to look after the local interests.

The former legislative power of the Residents, viz. the issueing of orders and police regulations, now belongs to the activities of these local councils, which are further concerned in all subjects of internal importance, the care of which has been assigned to them by ordinance.

Although the power of the Residents is therefore not as great as it was before the introduction of decentralization, nevertheless it is still very extensive. It includes, among other things, the maintenance of public order and safety, the care for the public health and campaigns against contagious diseases, the promoting of economic interests such as agriculture, cattle raising, irrigation, clearing of land, commerce and industry, supervision of education, religion, etc.

The Provinces or Districts are subdivided into Divisions at the head of which are Assistant-Residents, while the Divisions again are subdivided into sub-Divisions.

The European civil servants are trained at the State University of Leiden (Holland), which training consists of a three years' course.

For more advanced training of civil servants, the D. E. Indian Civil Service Academy was established at the Hague in 1907. To officials, who have served for some years and who are considered qualified for the higher ranks, an opportunity is given at this institution to follow a two years' course in the various systems of colonial government, parts of the D. E. Indian civil and criminal law, political economy and statistics and an advanced course in the modern languages.

Besides the civil servants, who have been trained at Leiden, there is another class of officials, who exercise governmental authority in the Outer Districts. These are called Civil Administrators (Gezaghebbers)and are partly military men (officers), who also have civil authority, partly civilian officials. Since 1914, candidates for this office have been trained in an institution established at Batavia and called the Civil Service College.

Candidates for admission must have some qualifications. They are appointed partly in Holland, partly in the D. E. Indies for a two years' course in this institution, during which time they receive an allowance. The subjects taught are almost the same as given at the lectures at the training college in Holland, but besides the subjects taught there and for the sake of practical training, instruction is given in the elementary construction of houses, bridges and irrigation works, construction of roads, hygiene, wound-dressing and medical treatment.

Besides European civil servants, there are Native officials throughout the Colony. Since the foundation of the Dutch East Indian Government, the principle has always been to leave the people under the rule of their own chiefs. The highest post, which a Native can occupy, is that of Regent and a son or the next of kin of the deceased or ex-Regent generally becomes the successor, in case he has the necessary qualifications and ability.

In his domain, a Regency, which generally corresponds with a Division, the Regent is the head of the Native population and advisor to the European official in charge of the Division. The Regencies are further subdivided into sub-districts with minor Native officials in charge.

The steady development of the people necessitates a constant raising of the standard of capacities and ability in the Native officials. In connection herewith, a more responsible part in the administration may also be given to them. This assignment of more responsible official duties to Native civil servants has already begun in the so-called „Emancipation of Native Government" of which further details are given below.

The training of these latter Native officials is in accordance with the higher requirements demanded of them; it is received in the training-schools for Native officials, while the Civil Service College in Batavia offers an opportunity to Native Civil servants, who are considered fit for the higher positions, to continue their studies, while retaining their salary.

In a two years' course they are given instruction in the Dutch language in the principles of Dutch East Indian law, also in political economy, for so far as of interest for the D. E. Indies. Agriculture and the care of cattle, construction of simple buildings and waterworks, the construction of roads, surveying, hygiene, wound-dressing and medical treatment also belong to the curriculum.

In the Outer Districts there are Native officials under a number of designations, but who lack the authority and the influence of the Regents in Java. The direct relation of the European official with the population is as a rule greater in these districts.

In the administrative system, the village communities occupy a special position, because in a certain measure they enjoy autonomy, which expresses itself in the management of their domestic affairs and in the election of their village chiefs, though under the supervision of European authority.

The village chiefs' duties consist of executing the regulations and orders of the superior authority, thus facilitating intercourse between the European administration and the Native population. The chiefs receive no fixed salary, but have a share in the taxes collected by them and the revenue of certain lands owned by the village community. They can also claim services of the inhabitants of their village.

3. *Emancipation of Native Government in Java and Madura.*

In order to free the Native administration in Java and Madura as much as possible in view of its stage of development, from the leading strings of

the European administration, and so that eventually it may assume a considerable part of the official duties of the European civil servants and in the main accomplish that task independently, an ordinance was passed in 1918; hereby in some divisions and regencies, to the opinion of the Governor-General, various activities and duties, formerly assigned to European or higher Native officials, can now tentatively be assigned to the Regent or to lower Native officials by decree from the head of the Provincial Government.

An initial trial of this emancipation was made in the division of Tjiandjur in the Preanger Regencies. The favourable results so far obtained in this instance, made the Government decide to extend the system to various other divisions and regencies in Java and Madura. It is the intention for the time being, to introduce the system of emancipation into at least one division or regency of every province, while in the other regions of administration it will be gradually introduced afterwards. Until now different divisions and two regencies have been selected for the application of the above mentioned emancipation.

4. *The Administration over Chinese and Arabs.*

With regard to the Chinese and Arabian population also, the Government has at its disposal several advisors of these nationalities, who also act as intermediaries in affairs concerning their own people. These are known as Chinese Majors, Captains and Lieutenants and Arab Captains and Lieutenants and are appointed and promoted by the Governor-General.

SELF-GOVERNING COMMUNITIES.

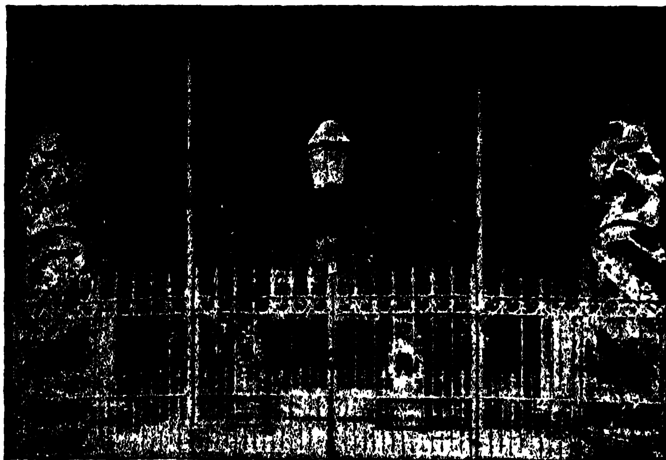
The D. E. Indies are politically divided into directly ruled territory and into territory where the Native princes and people enjoy self-government.

In the self-governed territory the Native authority remains established under Dutch sovereignty. The relationship between the D. E. Indian Government and the self-governing communities rests mainly on historical foundations and is regulated by political treaties or corresponding declarations.

The present policy is to maintain the self-governing communities as much as possible and to develop them; incorporation with the territory under direct rule takes place only on request or whenever such a proceeding seems inevitable in the interest of the population.

Formerly the treaties principally concerned the obligation of the self-rulers to prevent piracy, beachcombing and slavery, and not to enter into relations with foreign rulers. As long as the clauses of the treaty were not violated, the government did nod interfere with the internal affairs of the communities. The treaties have been considerably altered in the course of time in order to obtain the desired guarantees for a fair development of country and people.

Since the beginning of the present century it has been the aim to lay down the relation with most of the self-governing communities in treaties of simpler form. The existing detailed agreements were sometimes out of place in insignificant communities and sometimes proved an impediment to a vigorous interference by the Dutch Government. They were accordingly replaced by a political contract, called „Short Declaration" in which the self-government, among other things promises to obey all regulations and orders, issued by the Government with regard to the community. The regulation of the mutual rights, qualifications and obligations, which are described elsewhere in the treaties, was set forth in a legal regulation, the Ordinance concerning self-governing communities, which received its sanction in 1914, but has never come into force. In 1919 it was replaced by a new ordinance, revised and up to date (Zelfbestuursregelen 1919).



EXTERIOR OF CHINESE TEMPLE AT MACASSAR.

Wherever possible, small, insignificant self-governing communities are united into larger ones, with more capital behind them.

In 1923 the number of self-governing communities with a „Short Declaration" outside of Java, amounted to about 270, while 16 detailed treaties existed; in Java there are 4 principalities in Surakarta and Djokjakarta.

The D. E. Indian Government supervises the self-governing communities by means of its civil servants, who endeavour to aid the rulers in the righteous execution of their tasks and the Native administration of justice.

As one of the means of improvement may be noted the supervision of the education and training of future rulers.

A regulation, which dates from 1902, and which has contributed largely to the welfare of the communities, is the establishing of community treasuries (Landschapskassen), which are, when necessary, combined into sub-district or division treasuries; by this measure a separation is effected between the finances of the rulers and those of the self-governing communities. Formerly the ruler received the entire revenue, very much to the detriment of the community's interest; now the receipts derived from taxes, concessions, public industries, fines, etc., go into the public treasury.

The rulers receive a fixed salary and a moderate share of the returns from concessions and such like, while out of the public treasury are paid the expenditures for administration, education, medical assistance, construction of roads, bridges, waterworks, etc. Expenses incurred by the Government in the direct interest of the community are paid back, if possible. Every year a budget is made up, which requires the approval of the Resident.

General regulations have been made concerning the management, control and supervision of these treasuries.

In most of the communities the taxes, paid in natural products, have been abolished and taxes on trades and other revenues have taken their place.

Various public works are being undertaken on a large scale, which, in a number of states, are contracted for and carried out by some concern.

Figures underneath give a review of the receipts and expenditures of the treasury in a few successive years, while the expenditures for some of the subdepartments of the administration are taken up separately.

	TOTAL REVENUES	TOTAL EXPENSES	EXPENSES FOR				
			EDUCATION AND MEDICAL SERVICE	AGRICULTURE INDUSTRY AND COMMERCE	PUBLIC WORKS	PUBLIC ENTERPRISES	RESTITUTION TO THE D. E. I. GOVERNMENT
1912	f 12766434	f 7951429	f 249271	f 66920	f 1406997	f 70376	f 1301898
1913	„ 13932505	„ 8382048	„ 311318	„ 113318	„ 1745010	„ 79164	„ 1598884
1914	„ 15068127	„ 10028275	„ 292766	„ 92125	„ 2132099	„ 120708	„ 2271987
1915	„ 15608684	„ 10669840	„ 359593	„ 99249	„ 2606076	„ 90278	„ 2282588
1916	„ 17659899	„ 13295165	„ 423413	„ 174290	„ 3298913	„ 118742	„ 2390221
1917	„ 18145307	„ 14748428	„ 472829	„ 431291	„ 3969671	„ 150172	„ 2536421
1918	„ 17054392	„ 14646157	„ 556802	„ 400639	„ 4215130	„ 203507	„ 2375275
* '19	„ 16414086	„ 13603133	„ 618416	„ 546727	„ 3815347	„ 213965	„ 2179154
** '20	„ 17748644	„ 13508438	„ 797092	„ 464350	„ 3574546	„ 210894	„ 2392304
1921	„ 18357062	„ 15626327	„ 850190	„ 538047	„ 3285306	„ 315397	„ 2975346

* Except N. N. Guinea and West N. Guinea.
** Except N. N. Guinea.

PROVINCIAL AND MUNICIPAL GOVERNMENT.

In the provinces under direct rule, wherever circumstances permit, by the establishment of representative bodies, opportunity is given to the residents to take active part in the governing of provinces, districts and towns. The establishing of these magistracies dates from 1903 and went regularly into effect. The program of these political organisations is for the most part carried out, though not yet completely. The foremost principle is that the local magistracies will fit in as closely as possible with the interests formed by the natural situation of the country, the administrative division existing from former times and society.

The local magistracies have a task and a working-sphere determined by law. Within this sphere they are autonomic. Interference in their ruling is only permitted in cases determined by the law and through authorities named by law. Except for this limitation they are authorized for the carrying out of their task, to make general binding rules for the violation of which penalties may be imposed. They are authorized to impose taxes and to ask contributions for services done by the magistracy for the welfare of the inhabitants. They may contract loans, subject to the sanction of the state legislator. It is strictly seen to, that the interest and repayment of these loans is guaranteed, either by the revenues from the proposed works or by the balance of the imposed taxes.

To the local organisation, furthermore, is given as great a share as possible in that part of the Government's task, which has to do with the local upkeep, but which was formerly taken care of by the central magistracy.

All public works, such as roads, with the appertaining works and plantings, plantations, gardens, markets and market buildings, slaughter houses, cemeteries, as well as irrigation and drainage works, are under the management of the local organisations.

The working sphere of the local councils is almost unlimited, with this understanding however, that they can not fix regulations which are in conflict with those imposed by a higher authority, nor limit the authority of lower organisations.

These local councils are composed such, that they include representatives of all nationalities, residing in the district. In the town communities, which usually have a Eurasian character, the majority of the seats are given to the European element. In the more extensive rural districts, however, a majority in the council is pledged to the Native population.

In the councils which are established for provinces (provincial councils) and which often include more than one municipal resort, the majority still consists of officials and Europeans.

The assignment of members to these last-named (provincial) councils consequently took place by appointment. Members of municipal and district councils, however, are nearly always elected by the residents of the resort who are entitled to vote, or in accordance with existing popular custom. The right of election for these councils is being gradually extended in a liberal sense.

On the basis indicated here, councils are established for the whole of Java, wherein the division of the existing residencies is followed. Furthermore, municipal councils are established in nineteen of the larger towns.

In the provinces outside of Java, the political organisation has also been energetically taken in hand during the last few years.

Thirteen of the larger towns in the Outer Districts have municipal councils; various district resorts have been formed. Among others the so-called Agricultural District on the East Coast of Sumatra was declared a separate resort.

Provincial councils are not yet established outside of Java and Madura.

The reforms of the bases of provincial and local government in the D. E. Indies are laid down in the law of Febr. 6th 1922. By this law it was enacted i.a. that the D. E. Indies must be divided by general decree in provinces and other districts. It is the intention to make a small number of new provinces of a greater extent, which, to a certain degree, will have autonomy and self-government and in each of which Provincial Councils will be established.

The Provincial Council will appoint a Board of Deputies who will have charge of the daily conduct and the execution of affairs. The working of the Provincial Council and of the Board of Deputies will be subject to the control of a Governor, who will be appointed for each province. Further the possibility is left open to appoint by ordinance parts of provinces as self-governing communities, in each of which a council must be established.

The above mentioned reforms of the Civil Service have however not yet been carried out.

THE LEGAL SYSTEM.

The classification of the population of the D. E. Indies into Europeans, Natives and Foreign Orientals has also its influence on the legal system.

The statutes, which regulate the administration of the Dutch East Indies (Regeeringsreglement), where Europeans are concerned, demand that their rights must be similar to those in Holland, in so far as particular conditions in India or the desirability of enforcing a rule at the same time for another group of the population, do not necessitate a variation.

The civil, commercial and criminal codes for Europeans are almost the same as those in the Netherlands.

For Natives and Foreign Orientals the same criminal code is in force as for Europeans; the civil code of these two groups of the population is based on the principle, that as far as their social standing permits, they are subject to the same laws as the Europeans, while moreover their "adat" (native law) is respected as much as possible.

The practice of this principle has led to the Chinese, in the greater part of India, being subject to a law almost similar to that of the Europeans in its regulation of civil and commercial codes, which regulation will soon be extended over the whole of the Indies.

The other Foreign Orientals have to abide in most provinces by the European property law, but their family laws are still ruled by their "adat". This regulation, also will soon be enforced throughout the whole of the Indies.

For the Natives, as far as the civil law is concerned, their "adat" is practically unchanged.

Natives and Foreign Orientals also have the opportunity of making themselves subject to the civil and commercial law for Europeans.

It is the aim of the legislator to do away with the difference in law, wherever possible. In order to obtain as much uniformity as possible, a ge-



TYPES OF THE POPULATION IN JAVA.

neral civil code is in preparation, which, as far as property rights are concerned, gives an almost uniform regulation, and which, with regard to family law and relative matters, has only such differences as can not be avoided on account of diverse creeds and social opinions.

In a similar spirit the commercial law will be revised; the penal code, as mentioned above, is already unified.

The above is for so far as the Native population is concerned, not completely in force in self-governed regions and in directly governed regions, where the people are left to enjoy their own legal administration. The Native jurisdiction in these regions, however, is strongly influenced by the Government officials who, especially with respect to the penal code, have introduced as much as possible our views.

The administration of justice.

With regard to the administration of justice in these colonies, we observe principally three rubrics:

a. administration of justice for Europeans and those assimilated to Europeans;
b. Government administration of justice for Natives and Foreign Orientals in regions under direct rule;
c. Native administration of justice in self-governing communities and in some parts of the directly governed regions where the people, either for political or for practical reasons, have the benefit of their own administration of justice.

Only the administration of justice mentioned under *a* and *b*, is administered in the name of the Queen.

Europeans and those assimilated to them are usually tried before European magistrates, throughout the whole of the D. E. Indies, except in several parts for minor offences. The magistrates, who try Europeans also handle civil and commercial suits, brought against Natives and Foreign Orientals, in case these suits come under the jurisdiction of European law. In the directly governed regions, Government administration of justice for Natives is the rule.

In Native administration of justice, the activity of the Indian Government is limited to control, so that cruel and barbaric punishments, which are forbidden, are not administered.

The Native courts are usually presided by a European Government official, whose interference is limited to giving advice.

The Native administration of the law in selfgoverning communities is confined to the subjects of the selfruler. Government subjects come under Government jurisdiction.

Government magistrates also act in these regions, when offences against direct subjects or properties of the Government are tried, as well as in transgressions with respect to taxes, import and export duties and to ordinances, where this is stipulated.

The jurisdiction of the self-governing communities is often very limited.

As an example of Native jurisdiction in directly governed regions may be cited the so-called religious jurisdiction in Java and Madura, which is carried out by councils of priests, so far as marriage and heritage laws are concerned, which, more than any other part of the jurisdiction, is under the influence of the commandments of Islam.

Courts.

Europeans are brought to trial before one of the Courts of Justice, of which there are 3 in Java, 2 in Sumatra and 1 in Celebes. Higher appeal may be made at the High Court of Justice (Hooggerechtshof) of the D. E. Indies, which is also a Court of Cassation and which has its seat in Batavia.

Minor civil cases are handled by the Residential Court (Residentiegerecht), which is presided by the local president of the „Landraad".

The court for the Native population and Foreign Orientals is the „Landraad" or a board with equal powers, in Java and Madura presided by a judicial official. In the Outer Districts are still many Native Courts under the presidency of civil service officials. For some years past it has been decided that also Native lawyers may occupy the chair. The members are Native chiefs, some of whom take the seat by virtue of their office, some of whom are appointed by the Governor General.

To each „Landraad" is attached an advisor of the same nationality or religion as the accused, who gives information regarding the „Adat" (native law). From the „Landraad" higher appeal may be made to the Courts of Justice (Raad van Justitie).

Minor offences for all groups of the population in Java and Madura are dealt with by the „Landgerecht". The judge of this court is a lawyer or another official, especially appointed. In the Outer Districts the Magistrate Court (magistraatgerecht) has this authority over Natives and Foreign Orientals; except in the five places where a „Landgerecht" is established, it deals also with minor civil cases.

There is no higher appeal in cases of minor offences. There is however the obligation to register all sentences passed, while the High Court of Justice of the D. E. Indies may look into the registers at any time.

It is planned, also, to extend the „Landgerechten" to the Outer Districts. Already four „Landgerechten" have been established in the Government of Sumatra's East Coast and one in Macassar. Cases of violation of the law which in Java and Madura come under the jurisdiction of the „Landgerecht" are tried in the Outer Districts, in places were no „Landgerecht" is established, by the Residential Court, when the accused is a European.

In Java and Madura minor civil cases and Native legal offences are tried by the Regency- or District Court (Regentschaps- of Districtsgerecht), consisting of the Regent or the Chief of the District, each for their own district.

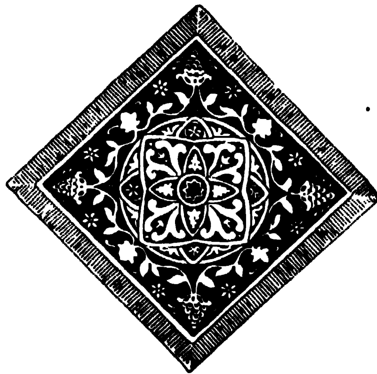
From decisions of the District Court, in civil affair, a higher appeal may be made to the Regency Court.

From decisions of the Regency Court a higher appeal may be made to the „Landraad".

It is the intention to unify the law of proceeding as well as the material law. As far as the „Landgerecht" proceedings are concerned, this unification is already attained, all minor penal cases are handled alike before this court. A plan for the unification of the entire remaining penal proceeding is ready, but not yet fixed. The unification of the civil proceeding is still being worked on.

The legal proceedings for Europeans here, are much the same as in Holland, while for the Natives it is simpler and less expensive.

The High Court of the Dutch East Indies finally exercises supervision over the entire legal administration in these Colonies.

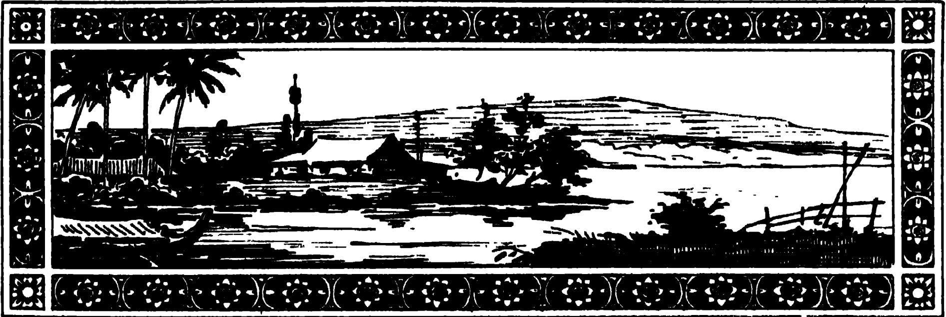


FINANCES

Public Finances.

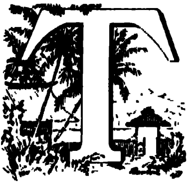
Taxes.

Monopolies.



CHAPTER III

PUBLIC FINANCES.

he Dutch East Indies are a corporate body, which is represented by the Governor General or by the Minister of Colonies. The budget of receipts and expenditures is drafted in the D. E. Indies each year about one year in advance and fixed preliminary in conjunction and according to the feeling of the People's Council. The definite budget is passed by law by the Government in the Netherlands.

The years 1906-1913 showed a strong development with a considerable increase of Government expenditure, which however did not exceed the revenues. The more intensive interference of the Government with economic affairs came especially to the credit of agriculture, irrigation, mining, education, hygiene and credit system, altogether expenses, which had to forward the economic development of these colonies.

In 1912 the Dutch East Indies, were acknowledged by the legislator as a corporate body, by which it became possible to float a loan in their own name. With this it was acknowledged that loans for permanent matters could very well be co-ordinated with a prudent financial policy.

Under the influence and as the result of the normal expansion policy of 1906-1913, greater supplies had been put at disposal, for it was on account of extraordinary expenditures in behalf of the commercial traffic, as railways, roads, harbours, as well as for a better equipment of Government industries and monopolies.

With the execution of the plans, which had been laid down in normal times and estimated on the footing of the prevailing quotations of the time being, it was however evident that the expenses by far exceeded the estimates by the advance in prices; all import goods had to be bought on top-prices. Further more, the ocmpletion of most of the works, as harbours and railways,



MENANGKABAU DWELLINGS (SUMATRA)

took place in time of deep economical depression; in consequence the financial results of the works were very disappointing and did not lead, as was expected, to an increase of the returns of these works.

The increasing interference of the Government with the economic life, led, as a matter of course, to increase of staff and better trained personnel, by which the expenses for the salary had to rise likewise. These circumstances, besides other expenses, consequent on crisis years, led to the expeditures surpassing the revenues so that the Government was obliged to float loans.

The first D. E. I. loan under this scheme was floated in 1915, while further loans were contracted in 1916, 1917, 1919, 1921, 1922 and 1923. The loans up to 1919 were partly raised in the Netherlands and for the other part in the D. E. Indies. In 1921 the loans were floated in the U. S. A. to a nominal of 100 million dollars in issues of 40, 40 and 20 million dollars. Recently amounta loan of £ 6.000.000 was floated in London.

Here under follows a statement showing the loans from 1883 up to and including 1923: (in guilders.)

LOAN	INTEREST %	NOM. AMOUNT	AMORTIZATION		REMNANT DEC. 31st 1924
			UP TO 1923	IN 1924	
1883	3	44.000.000	12.551.939	596.558	30.851.503
1898	3	57.815.000	29.441.500	1.490.000	26.883.500
1915	5	62.500.000	20.000.000	2.500.000	40.000.000
1916	5	80.000.000	14.000.000	2.000.000	64.000.000
1917	5	50.000.000	7.500.000	1.250.000	41.250.000
1919	6	180.000.000	18.000.000	4.500.000	157.500.000
1921 A	7	75.000.000	3.750.000	1.875.000	69.375.000
1921 B	6½	56.000.000	2.800.000	1.400.000	51.800.000
1921 C (£ 5.000.000)	6	60.535.000	—	—	60.535 000
1921 D ($ 25.000.00)	5½	62.195.000	—	—	62.195.000
1922 A ($ 40.000.000)	6	99.512.000	—	—	99.512.000
1922 B ($ 40.000.000)	6	99.512.000	—	—	99.512.000
1922 C ($ 20.000.000)	6	49.756.000	—	—	49.756.000
1923 A	5	65.000.000	—	1.625.000	63.375.000
1923 B (£ 6.000.000) ($ 25.000.000)	5	72.642.000	—	—	72.642.000
1923 C	5½	62.195.000	—	—	62.195.000
		1.176.662.000	108.043.439	17.236.558	1.051.382.003

The state of the floating-debt on Dec. 29th 1923, compared to the beginning of the year, appears from the following table:

	AT THE BEGINNING OF THE YEAR 1923	DECEMBER 29TH. 1923
Treasury notes issued . . .	glds. 100.000.—	glds —
Treasury bills issued . . .	„ 53.000.000.—	„ 79.150.000.—
Currency notes in circulation.	„ 42.683.786.50	„ 41.763.174.50
Advances of Home Government to the D. E. I. . .	„ 322.700.000.—	„ 101.400.000.—
Debet balance with the Java Bank	„ 11.473.646.11	„ 3.544.938.64
	glds. 429.957.432.61	glds. 225.858.113.14

It is expected that the floating-debt at the end of 1924 will amount to guilders 307.000.000.— so that the whole debt at the end of 1924 will be glds. 1.358.382.003. The total amount required for interest and amortization of all debts, including the floating and funded debt, reserved on the budget of 1924 amounts to glds. 85.597.830 (interest glds. 68.361.272, amortization glds. 17.236.558).

The interest and amortization of the loans claim an increasing share of the budget. The return to normal conditions however, has been vigorously taken in hand and it is expected that, as far as the ordinary service is concerned, after 1924, the expenditures will be in balance with the revenues. In order to attain this, extraordinary retrenchments have been introduced, personnel that could be spared was dismissed, the extra allowance for dear living was withdrawn; the services were reduced, sometimes closed and the works and extensions in course of construction are finished at a slower pace or even stopped. The decrease is shown in the following table in which expenditure and revenue of 1920/22 and the estimates for 1923 and 1924 have been put together (in millions of guilders).

YEAR	EXPENDITURE	REVENUE	DEFICIT	DEFICIT (—) OR SURPLUS (+) ON: ORDINARY SERVICE	EXTRAORDINARY SERVICE	ENLARGEMENT OF THE FLEET	SUPPLY OF RICE
1920	1.019.5	754.8	264.7	— 124.7	— 139.2	— 3.5	+ 2.8
1921	1.055.2	769.7	285.5	— 122.5	— 190.0	— 5.6	+ 32.7
1922	862.7	743.6	119.2	— 15.6	— 91.8	— 9.8	— 2.0
1923*	795.3	613.6	181.7	— 86.2	— 90.8	— 4.7	

That this decrease has really a radical influence, may be seen from the following table, in which the expenditures of 1921 are fixed at 100.

YEAR	TOTAL SERVICE		ORDINARY SERVICE		EXTRAORD. SERVICE	
	IN MILLION GLDS.	%	IN MILLION GLDS.	%	IN MILLION GLDS.	%
1921	1.055	100	821	100	190	100
1922	863	82	752	92	92	48
1923 *	795	75	694	85	91	48

Revenues.

The revenues consist of five principal groups, viz:

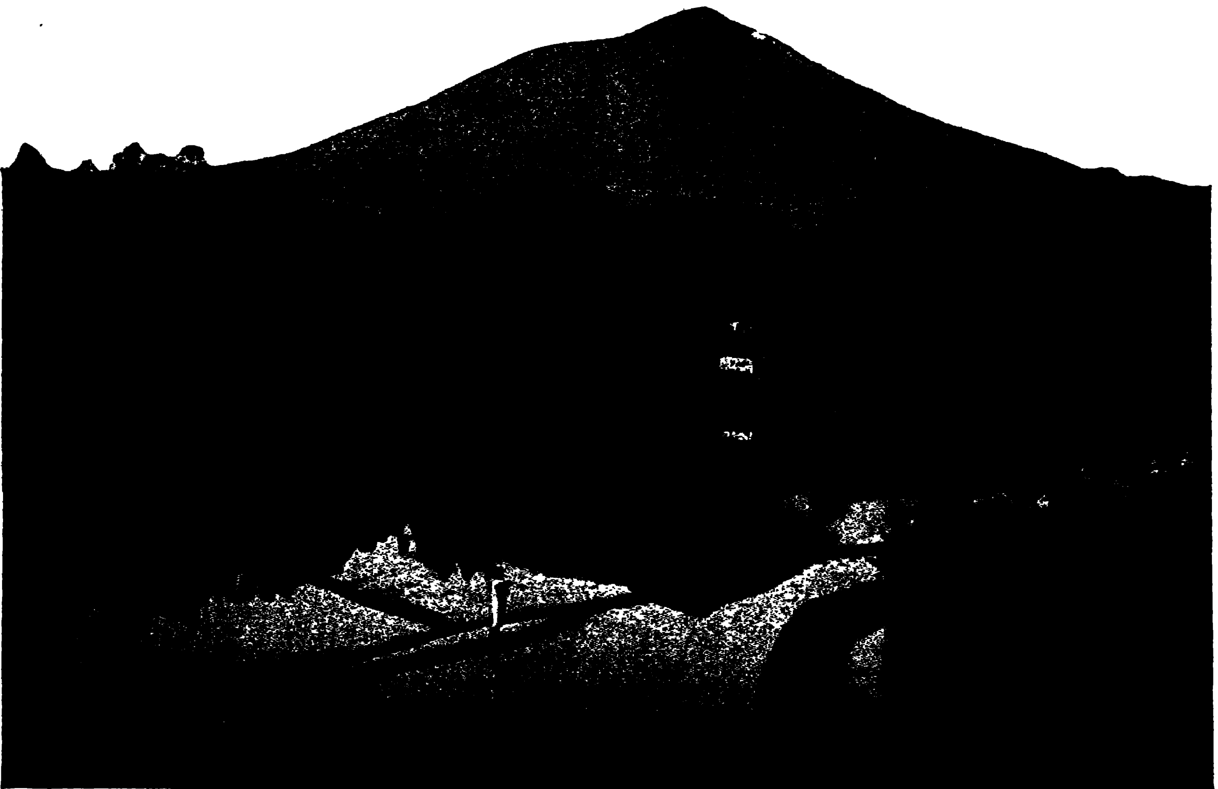
1. Taxes,
2. Surplus monopolies,
3. „ products,
4. „ industries,
5. Sundries.

1. *Taxes.* The tax revenues amounted to: (in 1.000 guilders.)

1920	199.788
1921	327.815
1922	393.873
1923*	225.503

Of all the revenues, those resulting from taxes are the most important; they amounted from 1920-1924 to 64, 77, 80½, 61½, and 65% of the total revenues.

* estimated



SAWAHS IN THE PREANGER REGENCIES

The increase of the proceeds of taxes in 1921 is due to the war Profit Tax, the Produce Tax and the Income Tax. In 1922 the proceeds of most of the taxes were less than in 1921, but on the other hand, the income tax rose from 46.9 million to 166.1 million, which is exclusively the result of payments of assessments of former years. In relation with the less favourable economical condition, the revenues for 1923 have been estimated less.

The revenues from some of the most important direct taxes amounted to: (in 1.000 glds.)

	1920	1921	1922	1923*
Tax on personal property	2.024	2.644	3.613	2.500
Income Tax	25.744	46.866	166.091	48.400
War Profit Tax	27.388	53.490	35.614	pro mem.
Land revenue	23.861	23.899	27.994	32.368
Head money	9.589	9.837	10.102	10.898

2. *Monopolies.* The surplus of Government monopolies: opium, pawn=shops and salt, amounted to: (in 1.000 glds.)

	1920	1921	1922	1923*
Opium	41.226	44.546	32.836	35.948
Pawnshops	4.894	5.352	8.540	8.302
Salt	8.813	7.913	8.078	11.971
	54.933	57.811	49.454	56.221

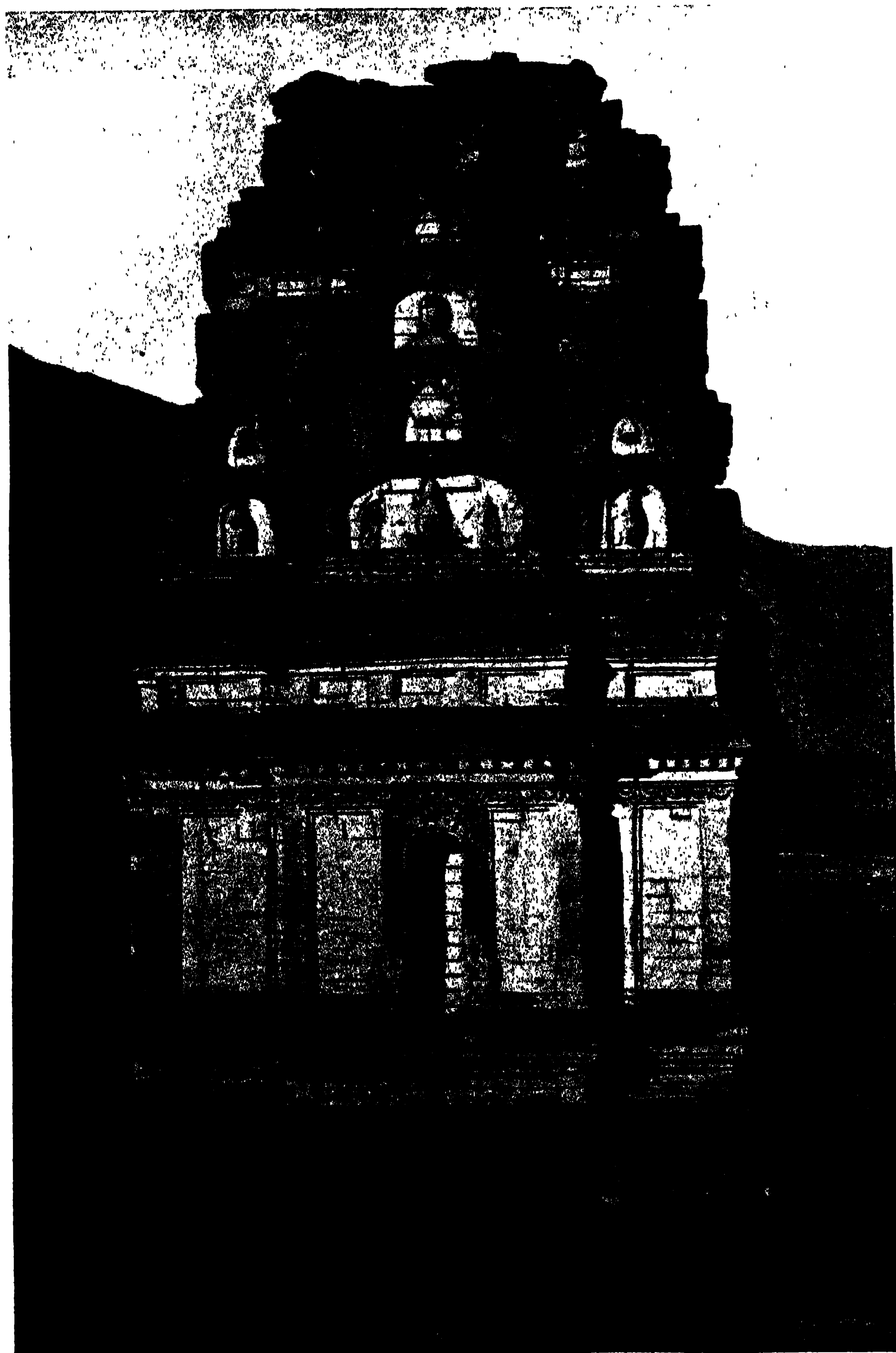
3. *Products.* The revenues under this heading arise from the surplus of the forestry service, cinchona=, gutta percha= and rubber estates, tin=, coal= and gold mines exploited by the Government; these revenues amounted totally to: (in 1.000 glds.)

1920	1921	1922	1923*
37.586	20.360	20.160	27.632

4. *Industries.* The revenues from industries arise from the surplus of different Government services, as railways, post=, telegraph= and telephon service, harbours etc. and amounted to: (in 1.000 glds.)

1920	1921	1922	1923*
10.206	3.032	9.135	46.460

* estimated



CHANDI BIMA ON THE DIENG PLATEAU. (MID JAVA)

5. *Sundries*. This heading includes the share of the Government in the profits of the Java Bank, mining concessions, cession of land, etc.

The revenues under this heading amounted to: (in 1.000 glds.)

1920	1921	1922	1923 *
9.497	16.618	16.880	11.142

The total receipts (ordinary service) therefore amounted to: (in 1.000 glds.)

1920	1921	1922	1923 *
312.009	425.637	489.502	366.958

Expenditure.

Ordinary expenditure: Against these revenues appear the net ordinary expenses, except those for monopolies, products and industries to an amount of: (in 1.000 glds.)

1920	1921	1922	1923 *
436.710	548.160	505.146	453.185

The principal net ordinary expenditures amounted to: (in 1.000 glds.)

	1920	1921	1922	1923*
Civil Service	16.530	14.995	14.341	12.449
Local and provincial Government	18.506	20.348	22.157	19.403
Police	18.580	22.973	19.166	18.090
Interest and amortization	43.984	71.680	72.594	78.171
Passage from, to and in D. E. I. (civil servants)	17.861	21.764	22.322	18.552
Education	35.747	40.156	36.347	34.452
Civil Medical Service	16.497	21.152	17.373	18.496
Public Works	43.376	44.726	25.861	28.997
War Department	114.924	121.906	121.618	99.718
Navy	22.842	26.593	28.841	23.121

Extraordinary expenditure: The extraordinary expenditures amounted to: (in 1.000 glds.)

* estimated

	TOTAL	MONOPOLIES	PRODUCTS	INDUSTRIES	GOVERN-MENT EX-PENDITURE
1920	139.216	9.226	7.902	97.599	24.489
1921	190.449	13.179	8.619	147.186	21.465
1922	92.234	8.007	5.219	61.919	17.089
1923 *)	91.072	1.408	5.109	60.610	23.945

* estimated

The extraordinary expenditures concern capital expenditure in behalf of the monopolies, estates, industries and works of a permanent character, such as those, in behalf of irrigation, harbours, mining etc.

TAXES.

The revenues of the State are, amongst others, obtained from direct and indirect taxes.

The most important of the *direct taxes* are the following:

1. Tax on personal property,
2. Income tax,
3. Land tax,
4. Land revenue,
5. Head money.

Besides these fixed levies, temporary taxes are levied on the profits of sugar, coffee, tobacco and tea estates.

1. *The tax on Personal property,* which up to January 1st 1920, was only levied on Europeans and their equals, is since this date being levied on the whole population. Exempted are—subject to reciprocity — among others consular representatives of foreign powers, who are of foreign nationality and do not have a profession nor carry on a trade in the D. E. I.

The tax amounts to 5 % of the rent of the houses and 2 % of the value of the furniture, while there are further charges for horses, bicycles, carriages and motor cars.

2. *The Income tax* is levied from residents in the D. E. I. (with the exception, — subject to reciprocity, — among others of consular and other representatives of foreign powers, who are of foreign nationality and do not have a profession nor carry on a trade in the D. E. I.), of limited and other companies established in the D. E. I., of non-resident natural and corporated

bodies, which carry on a trade in the Dutch East Indies, which share in the profit of concerns established in the Dutch East Indies under a firm, company, shipping company or partnership, or either receive income from real estate in the D. E. I. The tax is levied from natural persons, according to their net yearly income, from the limited companies and other associations in general from the yearly net income, the yearly extra profit and the yearly excess profit. By yearly extra profit is understood the yearly net income, less the tax on this income and ten percent of the working capital. By yearly excess profit is understood the dividends to shareholders, founders, concessionholders etc. less 8% of the capital.



PADANG HIGHLANDS. THE HARAU RAVINE

The tax is levied from the various groups of tax payers according to different tariffs.

(As a temporary measure a surtax is charged on the income tax).

The income tax, as far as the Natives and their equals are concerned, has taken the place of the various taxes on the trade and other revenues, which these groups of the population had to pay up to January 1st 1920.

3. The *„Verponding"* is a land tax, which is in force in different parts of the D. E. Indies.

This tax is levied on:

a. real estate of which, according to the general rules, deeds of property have been registered.

b. real estate, which is held by virtue of a deed, granted during the British occupation of 1811-1816.

For the property mentioned under *b* the tax amounts to 1% of the rental value (verpondingswaarde) for the others to ¾%. The rental value is fixed for 5 years. In general it amounts for the buildings and appurtenances to ten times the annual rent at the beginning of the year, preceding the tax year; for leasehold property seven times and for other real estate property ten times the average yearly proceeds over a period of five years, preceding the above mentioned period.

4. The *Land revenue* (Landrente) is a tax imposed on land possessed by Natives, which does not fall under the regulations of the land tax (verponding).

For the levying of taxes, the lands are divided into two kinds:

a. sawahs (irrigated ricefields);

b. non-irrigated fields, fish ponds and nipah groves.

The percentage, which is levied on the taxable produce of the sawahs, amounts at the lowest to 8 and at most to 20%; on the non-irrigated lands, fish ponds and nipah groves not less than 25 cts. and not more than 20 guilders per bahoe is levied.

Besides this Land Revenue there are still some other rural revenues (principally in the Outer Districts) which are of less importance.

5. *Head money* (Hoofdgeld) is levied from the Natives in Java and Madura, instead of the statute labour in behalf of public works or public institutions, which has been abolished.

SURVEY OF THE REVENUE OF THE ABOVE MENTIONED DIRECT TAXES: (IN 1.000 GUILDERS)

	TAX ON PERSONAL PROPERTY	INCOME TAX	LAND TAX	LAND REVENUE	HEAD MONEY
1920	2.024	25.744	5.996	23.861	9.589
1921	2.643	46.866	6.313	23.899	9.837
1922	3.613	166.091	6.975	27.994	10.102
1923*	2.500	48.400	7.000	32.368	10.8

*) estimated.

To the *indirect taxes* belong:
1. The import and export duties,
2. The excises,
3. Duty on the transfer of property,
4. Death duties,
5. The stamp duties.

1. *Import and Export duties.* The levy of these duties is not of a protectionist, but of a fiscal nature. The Netherlands Indian Tariff Law of 1872 has since been repeatedly altered and revised again in 1921.

The tariffs are the same for imports from Holland and abroad and amount to 6-12% ad valorem, while for some articles the amount is fixed according to the volume or the weight and some are free of duty.

As contrasted with Holland, export duties are charged in this country on some articles.

By virtue of the Tariff Law, the Governor General is empowered to tax several of the export articles in the Outer Districts. Except in Bali and Lombok it is mostly the jungle products, which are taxed in the Outer Districts. The relative regulations were all put together in an Ordinance, in 1910, which has since been revised.

The customs territory, that is to say those districts in the D. E. I., where duties are charged by the Government, has been constantly extended during the course of years, especially since the Government took the right from the various chiefs of the Self-Governments against indemnification, and now covers nearly the whole of the Dutch East Indies. The Self-Governments now enjoy a fixed income instead of uncertain levies.

2. *Excises.* Excises are levied on home made spirits, petroleum and petroleum products, matches and tobacco.

The excises on homemade spirits have since 1874 been levied on all alcohol, distilled in the D. E. I.

The petroleum duties, introduced in 1886 and revised several times since, are charged on petroleum and volatile petroleum distillates, imported from abroad for consumption and of the home produced petroleum and volatile distillates used for local consumption.

The duty on matches dates back from 1893, foreign as well as home made matches being taxed.

The excise on tobacco, which is of little importance, is charged in Borneo since 1829 for special brands of tobacco imported from overseas.

3. *Duty on the Transfer of property.* The deeds of transfer of property or the leasehold on real estate are subject to a tax, called transfer fee, which amounts to 5% of the value of the property. This tax is also charged when registering or transferring ships with a tonnage of 4 koyangs (1 koyang= 30 picul) or more, also when the above mentioned property and ships change hands, owing to the death of non-Europeans.



PAM NGPEUK ,OUTH COA AVA

This regulation dates from 1834 and has since been somewhat revised. In 1885 this regulation was also made applicable in case of transfer of building lease-hold.

4. *Death duties.* The duty of succession (Recht van successie) is a tax on inheritance charged on the value of all what is inherited or obtained from the personal estate upon the death of a European resident or his equal. This duty varies between 1½% with inheritance in the direct line and 15% when distant relations are heirs.

The transfer duty (Recht van Overgang) is a tax, which is charged on all real estate situated or established within the D. E. I., obtained from the personal estate of somebody, who is not a resident of the colony. It amounts to 3% with inheritance in the direct line and to 8% in all other cases.

It is worth mentioning that for the levying of the last mentioned duty it makes no difference, whether the deceased is a European or not; the real estate left by a Chinese f.i., not residing in the D. E. I., is subject to this duty.

5. *Stamp duty.* Under this name a tax is charged on the documents mentioned in the Stamp Ordinances of 1921 (Official Gazette No. 498) and 1922 (Official Gazette No. 570) in accordance with the regulations, mentioned therein.

The tax, as a rule, amounts to one guilder fifty cents per document, which is made up as a proof of transactions, deeds etc. Only for legal verdicts and notarial acts the tax is proportional to the size of the paper, which is used for it.

For receipts above glds. 10.— and a few other less important documents the tax is fifteen cents, while stamp duties are charged for the registration of concessions and similar permits.

The stamp for foreign passports amounts to glds. 2.50 or glds. 5.— which depends on whether they apply to one person or more.

Besides these fixed stamp duties, proportional ones are charged, of which the principal ones are:

1. the stamp duty on insurance policies,
2. on long dated drafts and other commercial papers,
3. on rent agreements,
4. on shares,
5. on capital invested in limited companies,
6. on bills and contracts covering transactions in shares and produce.

With the coming into operation on November 1st 1921 of the stamp Ordinance of 1921, the Stamp ordinance of 1885 (Official Gazette No. 131), and all further legal ordinances and regulations dealing with stamp duties before this date, were automatically cancelled.

The following table shows the revenue derived from the principal *indirect taxes*: (in 1.000 guilders)

	IMPORT	EXPORT	EXCISES	STAMP DUTIES	TRANSFER FEES	DEATH DUTIES
1920	60.633	4.437	15.565	5.277	4.821	481
1921	67.779	5.898	20.898	6.725	4.078	716
1922	56.210	9.816	26.430	11.337	2.439	335
1923*	60.000	5.000	31.685	12.100	3.500	450

* estimated

GOVERNMENT MONOPOLIES.

1. The Pawnshop Department.

To overcome the grave disadvantages connected with the existing pawnshop licences, which went hand in hand with usury, the Government decided in 1903, after a trial period, to take over the exploitation of pawnshops. This exploitation has since been gradually introduced throughout Java and Madura, while at the same time the licences have been withdrawn.

In 1917 this measure was completed and the licenced pawnshop in Java is now a thing of the past. During the years 1918, 1919 and 1920 it was found necessary to increase the number of the pawnshops and consequently new establishments were erected.

In 1921 the exploitation of Government pawnshops was started in the Outer Districts (Sumatra), but owing to the policy of retrenchment, no further extension was given to the scheme.

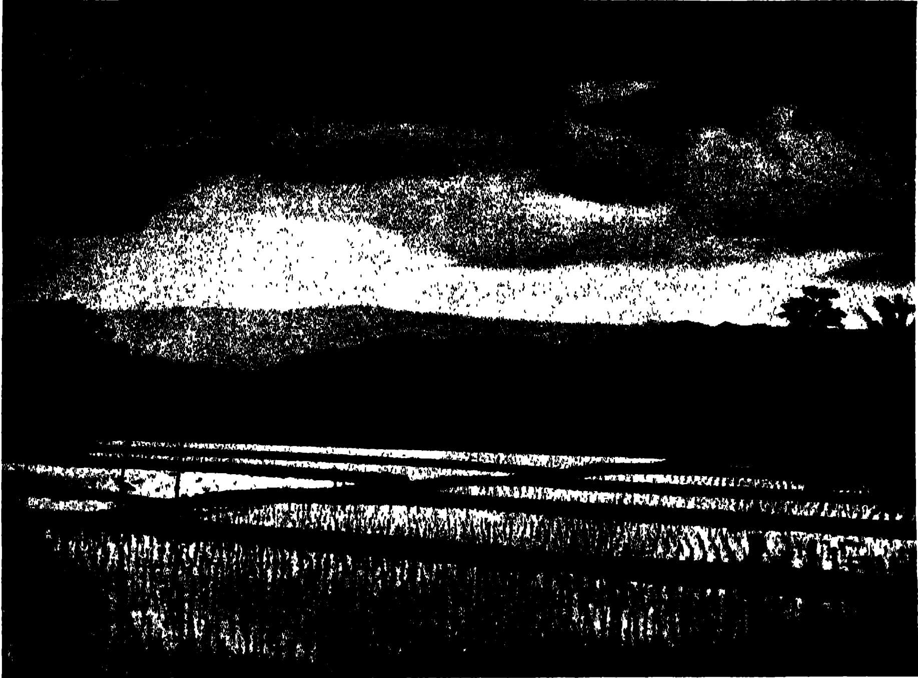
Where the Government exploitation exists, it is forbidden under penalty to give loans either in money or merchandise in smaller amounts than glds. 100.— against the receipt of a pledge.

These prohibitory measures were introduced in 1910 in order to put down clandestine pawning, which was then very prevalent and by which the purpose would have been lost for which the Government exploitation was striving.

The turnover of this exploitation is steadily increasing, especially since, during the course of 1912, the valuation of the pawns was revised and the article pledged is no longer calculated according to its intrinsic, but according to its market value, whereby higher amounts may be lent.

After a certain time has elapsed the unredeemed pawns are sold at auction. If a profit remains above the money advanced plus the interest, this is kept for a year at the disposal of the borrower.

As a rule the management is in the hands of European officials. In the smaller pawnshops, where the sums loaned amount to the limit of glds. 150.000, Natives are also appointed.



RICEFIELDS

The exploitation shows a loss on loans for amounts of fifty cents and less, but outside of that it leaves a profit.

The following table shows some figures with relation to the pawnshop service.

	NUMBER OF PAWNSHOPS	NUMBER PAWNS BROUGHT IN	LOANS GIVEN IN GLDS.	NUMBER OF PAWNS REDEEMED	NUMBER OF PAWNS SOLD AT AUCTION	COST OF EXPLOITATION IN GLDS.	BALANCE
1920	360	35.790.377	136.518.129	33.636.111	1.939.732	11.086.736	2.324.940
1921	371	34.522.743	142.529.063	30.266.737	2.781.984	12.046.477	2.002.487
1922	371	37.376.962	151.909.568	33.513.837	3.291.335	11.852.312	4.659.001

2. *Government Opium Monopoly.*

Before September 1st 1894 the retail sale of opium was licenced in Java and Madura. The licence system lead to much abuse and encouraged the use of opium. It was because of this that the Government, on the

mentioned date, started with the distribution of opium under Government control under the title of „Opiumregie". (Government Opium Monopoly). In 1904 this control had come in force throughout Java and Madura. In 1913 the Government Opium Monopoly had been introduced in all the Outer Districts, except in a part of the Ternate Residency and Dependencies and the districts South and West New Guinea. Since then the Government monopoly has been introduced there, so that now the Government monopoly is in force throughout the Dutch East Indies.

The use of opium here is restricted as much as possible by strong Government measures.

3. The Salt Monopoly.

With a few exceptional cases, the manufacture of salt, other than for the needs of the Dutch East Indian Government and with its sanction, for a long time has been prohibited in Java and Madura, while in the Outer Districts, until recently, it was made for the most part without restrictions.

At the present time, also, salt manufacture is carried on with restriction in a number of provinces in the Outer Districts, but only in a primitive way by the Natives for their own or for local use. In South Celebes salt is manufactured on a larger scale and from this source of supply is distributed to the surrounding islands.

In most districts of Sumatra and Borneo the Government has established a monopoly, while in some parts of Sumatra the import is free, but the manufacture is prohibited. In those parts salt is imported, chiefly by private concerns, from Singapore, Penang, British India and Siam.

The manufacture by the Government takes place on the island of Madura, where the salt is obtained by the Natives by evaporating seawater in pans, after which it is delivered to the Government at a fixed price of 15 guilders per kojang (± 1.680 K.G.).

Some suitable fields have also been purchased by the Government for the purpose of taking the manufacture partly into its own hands. The conversion of those fields into saltland is partially completed and so the Government began to manufacture its own salt.

The product is sold in block form. These blocks are made in two factories in Madura.

The transport to the saltsheds and shops is usually done by the Government. The sale is carried on for the Government by European and Native salt vendors. The monopoly price is fixed at 8 cents per brick (1 kati = 0.6176 K.G.) while in some districts of Sumatra the price is 10 cents per brick.

Importation of salt into the districts, over which the Government exercises a monopoly, is forbidden, unless it is fine table salt or required for the preservation of foodstuffs and packed with them.

Beneath follow some figures regarding the production, sale and revenues derived from the salt monopoly during a period of three years:

YEAR	QUANTITY OF SALT DELIVERED IN TONS OF 1000 K. G.		FACTORY PREPARATION PRODUCTION IN TONS OF 1000 K.G.	QUANTITIES DISTRIBUTED IN TONS OF 1000 K.G.		
	NATIVE SALT LANDS	GOVERNMENT SALT LANDS		BRICKED AND PACKED SALT FOR CONSUMPTION	RAW SALT FOR FISHERY AND INDUSTRIAL PURPOSES	TOTAL
1920	64.982	1.497	145.606	134.689	24.995	159.684
1921	149.256	5.653	150.819	131.607	27.962	158.663
1922	174.671	6.508	128.381	131.204	23.935	155.139

RECEIPTS AND EXPENDITURE OF THE SALT MONOPOLY: (IN THOUSANDS OF GUILDERS).

YEAR	RECEIPTS	EXPENDITURE	BALANCE
1920	19.261	10.448	8.813
1921	19.010	11.097	7.913
1922	18.723	10.644	8.078
1923 *)	20.422	8.451	11.971

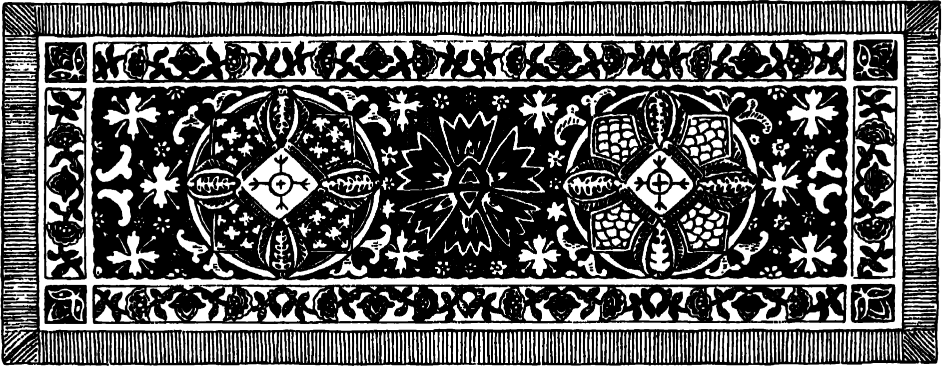
*) Preliminary results.



EDUCATION

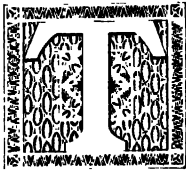
Education.

Technical training for natives.



CHAPTER IV.

EDUCATION.



he task of tuition in the Dutch East Indies is one of extreme difficulty to the Government. On one side an Eastern population of millions with a growing pressure towards development in Western direction, who, in increasing numbers, demands the opportunity for their children to attain the same standard of intellectual knowledge as the Occidental, without, however, themselves being able to provide as yet sufficient material means and intellectual knowledge to cope with their own educational needs.

On the other side a European population, which also demands the satisfaction of its educational needs, but which, owing to its small number, cannot itself make provisions for the necessary teachers.

Then there are difficulties of getting a sufficient number of qualified teachers out from Holland; questions regarding the problem of completing a homogeneous and practicable system of teaching, adaptable to the divergent demands of the various parties and, last not least, of finding the money in connection with the progressive increase of State expenditures for other necessities, just as important.

There is one group of schools for elementary and secondary education especially for Natives and another group especially for Europeans, while a group of institutions providing the young men of all nationalities with general and technical education establishes, so to say, a link between these groups.

It should be mentioned, that the schools for specific European education are not closed to non-European students.

These schools are open to all children who can follow the course of instruction with success. In this case it depends chiefly upon their sufficient knowledge of Dutch.

There is one school for higher instruction in the D. E. I. viz. the Higher Technical School at Bandung, for the time being only open for civil engineer training.

The certificate obtained in the Indian schools, which train for Law and Engineering, exempts the student from taking any preliminary faculty exa= minations at the universities in Holland.

By scholarships and other means, the Government gives the talented young Indonesian people, who have not sufficient means to continue their studies on their own accord, the opportunity of carrying on these studies at a university in Holland.

A closer study of the main forms of the educational institutions separately, may now follow.

In one large group of schools the teaching is carried on in one of the vernaculars, while in a smaller group, far more important in many regards, the Dutch language is used.

I. *Vernacular School.*

This group includes some 10.000 *desaschools* (a „desa" is a native com= munity) with a very simple curriculum, which can be completed in three years, and about 2.000 *native elementary schools,* which take four or five years to complete the course and which naturally, provide a better education than the desaschools. If pupils after completing the desaschool pass on to the socalled *continuation schools,* which consist only of the higher classes of the complete native elementary schools, they too can enjoy the complete elemen= tary education, which is vastly extending every year. There are also some 2.100 private native schools, which are subsidized by the Government. Some of these are similar to the desaschools, while others are more like the native elementary schools.

a. Desaschools.

The desaschools form quite a young branch of the educational insti= tutions, dating from 1907 and are chiefly meant to fight illiteracy. Reading, writing and elementary arithmetic are the chief objects taught, while the reading books contain matter for general development. The teachers stand under the leadership of supervising Native teachers, each having 50 schools under their control. These supervisers are really more „travelling teachers" than inspecting officials. The work of these supervisers is superintended by Native and European inspectors. The expenses of the desaschools are partly carried by the Native community and partly by the Government.

b. Native Elementary Schools.

The native elementary schools provide a better education than the desa=schools, not only for the longer term of study, but also because most of the head=masters have received a better training at colleges and Normal=schools. Great improvements have been introduced in the methods of teaching lately.

The desaschools provide a large number of pupils with a final education, the native elementary schools also. For those who wish to prepare for some calling or other, there are:

21 Normal=schools (term 4 years) and one Normal course (2 years) to prepare for Native Assistant=teacher, and a considerable number of courses (2 years) to train for desaschool teacher. In a relatively small number of years the Normal=schools have supplanted the Normal courses. The boarding arrangement and the European leadership of these Normal=schools make them far more preferable.

14 institutions for elementary tuition in agriculture. It is being attempted to reform these institutions so that they will be self=supporting.

19 institutions for elementary technical instruction.

One school for Native sailors.

c. *Link=Schools.*

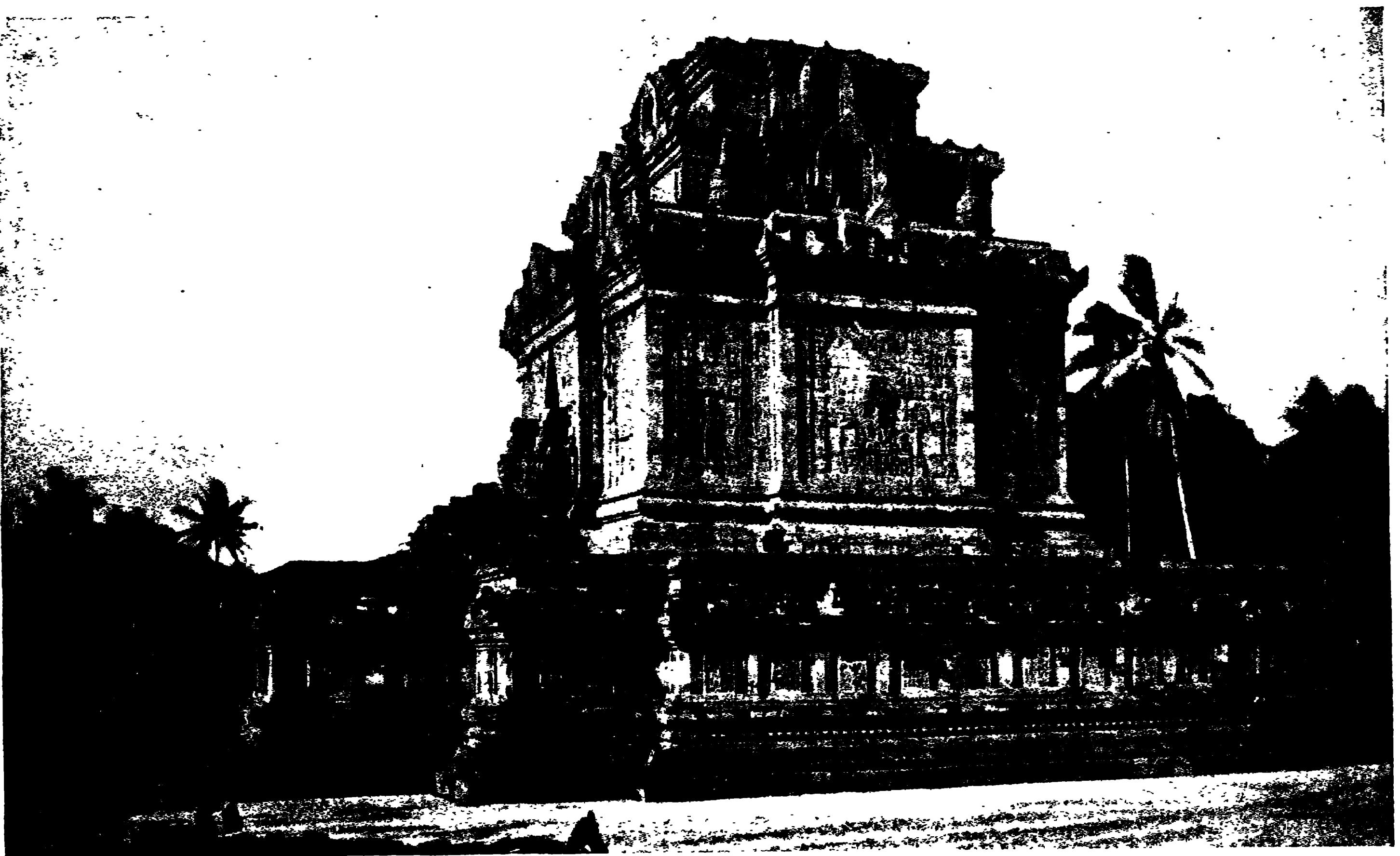
These schools form the connecting link for the pupils who pass on from the school where the vernacular is used to the school, where Dutch is spoken. The very best pupils of the Native elementary schools are selected for the Link=schools after completing the third standard: the technic of reading, writing and arithmetic is by then sufficiently practised and the mother=tongue known. Now the Dutch language can be started with and taught in the indirect manner; other proper elementary education is also given. The Link=school opens for the promising children of the lower classes the way to the advanced educational institutions, where the Dutch language is used.

II. *Western Schools.*

These are, especially by the language used, more interesting than the former larger group; starting with the preparatory schools (Kindergarten) they climb up along the elementary schools to secondary and higher instruction, thus offering an opportunity for a complete Western education. Truly, not yet in all respects; for the Higher Technical School at Bandung is only for civil engineer training, but the extension of this H. T. S. to a university is only a matter of time and money, the opening of a Law faculty being very near at hand.

1. *Preparatory Elementary Education.*

As regards the preparatory elementary education in the „Kindergarten", it is principally left to the care of private individuals, and is subsidized by the



CHANDI MENDUT. (RES. KEDU)

By courtesy of the Archaeological Service.

Government. Bandung has a Government training school for „Kindergarten" teachers with 93 students at the end of 1922.

2. *Elementary Education.*

The real Western standard elementary education is taught in 500 schools in a course of 7 years. A preparatory class, mainly for non=Europeans, is added to some of these schools and increases the term of the school to 8 years.

These schools are the *Elementary European*, the *Dutch=Chinese* and the *Dutch=Vernacular.* The names indicate the nationality of the pupils; European children principally go to the first mentioned, Chinese children to the second and Native children to the third.

a. Elementary European Schools.

The elementary European schools are similar to the elementary schools in Holland, although there are a few differences, when the two curricula are compared. This similarity is necessary for the children, who leave India and continue in the schools in Holland. We find the same parallel between the Indian and the Holland secondary schools for the same reason.

b. Dutch=Chinese Schools.

The Dutch=Chinese schools are generally similar to the European ele=mentary schools. This is due to the fact that part of the Chinese in Java feel the necessity of European culture, and are eager to get for their children an elementary instruction, which fits them for the European secondary schools. The Dutch=Chinese Training College at Meester=Cornelis had 95 Chinese students at the end of 1922 and sees to the training of competent teachers for classes of pupils of their own nationality.

c. Dutch=Vernacular schools.

The Dutch=Vernacular schools gradually grew out of the more advanced native elementary schools. At first, Dutch was introduced as a branch of tuition, given by European teachers, while the school remained under a Native head=master. The results were not satisfactory and led to disjoin these schools from the real Native elementary education. Finally they were thoroughly reorga=nized in Western style and only a Native tinge was kept through the verna=cular (and also Malay, where this is not the mother=tongue) on the curriculum and by the nationality of most of the teachers. As regards instruction books, furniture and buildings, the European schools were copied. This type of school is very much liked by the Natives as it provides them with an oppor=tunity of giving their children a Western education, which enables them to occupy higher positions.



PAMEUNGPEUK OUTH COA AVA

3. *Training Colleges.*

The native teachers of the Dutch=Vernacular schools are instructed at the Native Training Colleges (4 years). The students are boarders and receive not only intellectual but also physical and moral training. To the most clever ones the opportunity is given to carry on their studies for 3 years at one of the two Higher Training Colleges.

The greater deal of the European teachers at the three kinds of Western elementary schools have come over from Holland. As yet there is not a fit training college for them in India, although there is a non boarding State=Normal=School at Batavia, besides several private institutions in Java, which principally turn out female teachers. At the four principal towns of Java one can be trained for the Head=Master's certificate.

4. *Secondary Schools.*

After finishing the *European elementary school* the pupil who wishes to learn more can go to the *High School* or to the „Mulo" section of the *General Secondary School.*

a. High Schools.

The five public high schools are all of five years duration, with one exception, and have many parallel classes principally in the lower standards. Moreover, there are six State=aided private high schools, mostly having a three years' course, especially for girls.

As has already been mentioned, the high schools have been planned such, that the students can always pass over to the same institutions in Holland without meeting with any difficulties.

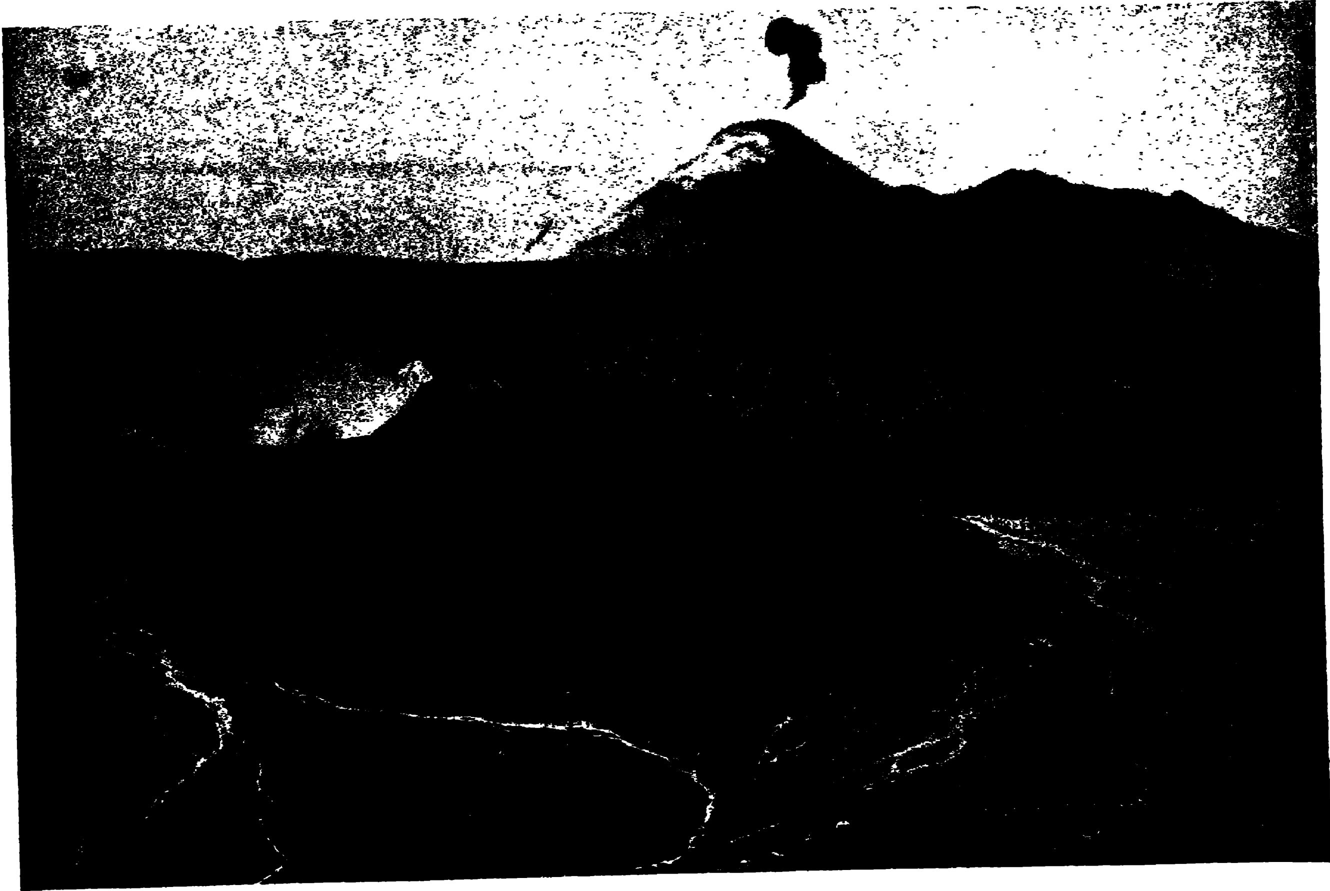
b. General Secondary Schools.

This is not the case with the general secondary schools, which have a three years' course (Mulo=Section) of continued elementary instruction, to meet the needs of the greater part of the Indian population, and a superstruc=tion also of three years duration. The certificate of the latter is equal to that of the high school with its five years' term.

To keep the stream of students, destined for the general secondary school with its six years schooling, from the five years' course of the high school, the language=test is used. The admittance requirements, as far as Dutch is con=cerned, are more exacting for the high school than for the „Mulo" section of the general secondary school.

The „Mulo" provides a large number of the students with a final education. Those who want it, may continue their studies in mathematics and physics at the superstruction of the General Secondary school at Djokjakarta, and for Western Classics at Bandung.

The first mentioned, like the five years high school, sends its cleverest students, who wish to become engineers, to the Higher Technical School at Bandung to continue their studies.



VOLCANO BROMO AVA

For those, who have followed the course of a Western elementary or a „Mulo"=school a number of institutions for definite professions or official functions is also open.

Those who wish to join the Native Civil Service, after completing the elementary school may be admitted to a Preparatory school for Native Officials (five years course with boarding) and after a few years actual service, may receive further instruction for a higher position in a two years' course at the Civil Service College (Bestuursschool) at Batavia.

Those who want a medical training, find all opportunity given at the Indian Medical Training School at Weltevreden or at the Dutch=Indian Medical School at Sourabaya. These schools have a talented staff and excellent means of teaching.

For future jurists the Law=School at Weltevreden was established; for those, who wish to go in for agriculture, there are an Agricultural High School at Buitenzorg and also agricultural middle=schools at Sukabumi and Malang; besides there is a training institution for Veterinaries at Buitenzorg.

The Prins=Hendrik School at Weltevreden has a three years' High School course and is in its two last standards a Commercial school.

Besides this public institution are several private institutions, which instruct young people, who are already in function, in bookkeeping and com=mercial correspondence.

The course of navigation, which used to be connected with the Prins=Hendrik School, is now given on board a Government steamer, so that practice and theory go hand in hand. For those, who wish to qualify in technical direction, there are five secondary trade schools (Batavia, Sourabaya, Djokja, Samarang and Bandung) and one three years' course of a lower plan (Batavia). In all these institutions the Dutch language is used as medium.

Finally we will mention six training institutes of a particular kind, with two courses of instruction for analysts and controllers of Public Health, one course of instruction for pharmacist's assistant, the Mining School at Sawah=Lunto, the Municipal Bureau Course at Batavia and the School for training Sugar=Chemists at Sourabaya.

A very important matter in the progress of a nation is the education and bringing up of girls, especially there, where the position of the woman in the family is far from equal to that of the man. This is the case with by far the greatest part of the Native population in the D. E. I. and that is the reason, why several attempts have been made in the last few years to give the Native girl an opportunity for education. Amongst the women who stood foremost in this endeavour, is first to be mentioned Raden Adjeng Kartini.

Her name has therefore been given to the Special Native girl=schools, the „Kartini=Schools". Some of them are now already equal to the Dutch Verna=cular schools. Besides these schools we find another type of Native girl=schools, especially in the Preanger Regéncies, which are similar to the ordinary Native elementary schools and do not have Dutch in their course of instruction;

these are the so-called Kaoetamaan Istri-Schools. Worth mentioning is the school for Native women-teachers at Bandung (Sundanese being the language used, with Dutch as a branch of tuition).

The Government did not lag behind in promoting women-education. Besides giving financial aid to several associations, it assisted also with teachers and established schools e.g. the Training School for Native Women Teachers at Salatiga and some five Normal Schools for Native Assistent Women Teachers. The first mentioned uses the Dutch language, the others have Dutch on their curriculum. Further, a start has been made with the opening of Public Elementary Native Girls Schools. It need not be mentioned that domestic science is also given in these girls schools (sewing, cooking, batik-work etc.).

TECHNICAL TRAINING FOR NATIVES.

Most of the handicraft in the D. E. I. is carried on by the Chinese; especially the carpenters are of Chinese nationality, further the tailors and also, though to a lesser extent, the workmen in the engineering shops. The typical character of the Chinese artisans is, that they work in entirely Chinese concerns and very rarely accept work in European shops.

As the European civilization penetrated into this country, there came a demand for skilled labourers for the railways, in the repair-shops of the State Railways, in the various industrial concerns, such as the sugar mills, tapioca mills and in the repair and engineering shops. In connection herewith there also came a demand for draughtsmen, for which profession the natives have a special natural aptitude.

In order to obtain mechanics for the above mentioned repair shops, the Government decided about 15 years ago, to establish trade schools. These gave every facility to train natives for the trades, which are a necessity in a European community, while it gave a wide opening to talented mechanics.

At the end of 1909 trade schools were opened in Batavia, Samarang and Sourabaya, which all had one section for carpentry and one for iron craft, while later also a course for motorcar drivers was opened at the schools in Batavia and Samarang.

Further a course in linear drawing and drawing by free hand, while a few lessons are spent in giving the students a more general training. The courses are given in Malay.

Each of the three above mentioned sections is in charge of a European expert, assisted by native assistant teachers.

The admission requirement is the school leaving certificate of the common vernacular school and the training takes three years. The tuition fees are low and poor pupils are entirely or partly exempted. The pupils, who leave the school with a final certificate, find a good livelihood with the Government

and on the European estates. It is very rare however, that pupils open up their own workshops.

At the present moment these schools are attended by about 650 pupils, of which 350 are admitted to the courses for iron craft.

By the establishment of these schools, which train more especially for the large industries, no provision was made for the training of simple mechanics, for the require= ments of the lo= cal demands up country.

In 1915 it was decided to esta= blish simple trade schools of a local character, which only had one course and a biennial training. At present there are 11 of these schools in the smaller boroughs of Java and Su= matra. Two of these institutions have a section both for wood and iron work; one has a section for wood work and basket work, while in the other schools there is either a section for woodwork of for iron work.



GOVERNMENT SALT PANS. MADURA.

For these schools too the admission requirement is the leaving certificate of the common vernacular school, the language taught in, is Malay or the language of the district. The schools are in charge of a European expert, assisted by native assistant teachers.

The pupils, who leave the school with final certificate mostly find work in their own district, while a few of them continue their training at one of the central schools in Batavia, Samarang or Sourabaya.

The number of pupils at present amounts to 790, of which 580 are admitted in the course of carpentry.



SANITARY CONDITIONS AND SANITARY REGULATIONS.



CHAPTER V

SANITARY CONDITIONS AND SANITARY REGULATIONS.



enerally speaking and especially in comparison with the surrounding countries, with the only exception of Australia, conditions of health in the Dutch East=Indies are not unfa=vourable, if one, as it is usually done, goes by the average yearly death=rate.

Since 1912 the death=rate in Java and Madura is carefully checked and worked out in statistics of mortality; the same is done with regard to the birth=rate.

For a few of the Outer Districts these statistics have also been introdu=ced, but only since a few years, so that no general conclusions can be drawn for the islands outside Java and Madura.

In Java and Madura the average yearly death=rate amounts to 20°/°°, in the year of the influenza epidemic 1918 this figure even rose to 36.5°/°°, but it soon dropped afterwards, until the figure of 20°/°° was reached again in 1922.

For comparison's sake figures of some of the surrounding countries are given: the average yearly death=rate in British=India amounts to 30°/°°, in 1918 to 62.4°/°°; in the Philippines 23°/°°, in 1918 41°/°°; in the Federated Malay States 32°/°°, in 1918 53°/°°.

The towns, especially those on the North Coast of Java, do not show the favourable figures of the rural districts. (The same phenomenon is noticed in the surrounding countries).

The yearly mortality figures of Batavia, Samarang and Sourabaya over the last 10 years fluctuate between 40 and 60°/°°, the figures of the inland towns are on the whole much more favourable.



MAIN ROAD AT TOSARI. (EAST-JAVA)

The figures mentioned above all refer to the native population.

For the European population the proportions are more favourable and approach more those, which one finds in the European towns.

The average yearly death-rate for the European population of Batavia, Samarang and Sourabaya, over the last 10 years, is respectively 16, 19 and 18°/°°.

As regards the diseases, to which one is most exposed in the Dutch East-Indies, should be mentioned malaria, the contagious abdominal and the nervous diseases.

Malaria is principally a disease of the coast places. Tandjong Priok, Samarang, Sourabaya, Tjilatjap, Belawan, Sibolga and many other places on the coast were or are partly still notorious for the scourge of malaria.

Fortunately a great improvement has been made in these conditions during the last 10 years, due to the extensive and costly drainage works, which were erected and completed in different places and as a rule turned out to be a great success (Sibolga, Tjilatjap and others).

Not only exclusively along the coasts, but also in some districts inland, yes sometimes even high in the mountains, malaria is a factor, which has to be thoroughly reckoned with.

A systematical research after the appearance of malaria in the Archipelago has been continued regularly for years and in connection herewith, measures are planned and carried out to improve conditions.

In the malaria districts the personal prevention, which consists chiefly in using mosquito-curtains and the regular taking of quinine is of great importance.

As the cause of death, at any rate for the Europeans, malaria is not of preponderant importance, but it is an exhausting and weakening factor, which opens the door to different other diseases and attacks.

The contagious abdominal troubles, one has to guard against here, are cholera, enteric fever, amebic and bacillary dysentery. According to statistics of Europeans, who died during the last 10 years, the percentage of those who succumbed to

cholera	was	2.20%
dysentery	„	2.65%
enteric fever	„	5.19%

Therefore 10% of all deaths must be put down to the whole group. Also here the outlook is more promising during late years.

In the first place by the greater care for good drinking water and for removal of faeces and dirt, by supervision of ice and lemonade factories, slaughter houses, public markets etc.

Various towns (among others Batavia, Samarang, Sourabaya, Bandung, Buitenzorg, Medan) have modern, well-controlled waterworks; in others such works are under construction or being prepared.

Secondly by the direct strong prophylactic combating of cholera and typhoid by inoculation on a large scale.

The fact, that the first mentioned disease has not appeared in the Archipelago during the last three years, is probably due to a large extent to these efforts.

The large number of cases of nervous break-downs most clearly appears from the fact, that on an average about 60% of the home leaves to Government officials, owing to illness, is granted on account of some nervous break-down.

In most cases this illness is caused by strenuous work in a trying climate, by loneliness, by family worries, by insufficient treatment of malaria or dysentery, or a combination of these causes.

To those whose minds are more or less unbalanced or have already had a nervous breakdown, a permanent residence in the Dutch East-Indies is certainly not advisable.

To a still greater extent this applies to those, who are susceptible to tuberculosis or have already had symptoms or an attack of it. Where formerly one was of the opinion, that there was little tuberculosis in Dutch East-India and thought that a stay there would be beneficial to tuberculous patients, one has now gradually come to a different conclusion.

The mortality from tuberculosis is fairly considerable there, for Europeans 8%, which does not differ much from the death-rate in Western countries. Furthermore about 9% die of diseases of the respiratory organs, which percentage probably also includes several cases of tuberculosis. In 1917 a society for fighting tuberculosis was founded, which has a few branches and has the

supervision of four sanatoria: Semplak near Buitenzorg, Patjet near Tjiandjur, Ngadiwono near Tosari and Batu near Malang.

In these Sanatoria patients of all nationalities are admitted.

Another disease to which more and more attention is being paid lately is cancer. The rate of mortality from this disease amounts to about 5 %. To make a closer study of this disease the Cancer Institute was founded at Bandung in 1922. Against the large mortality of malaria and infectious diseases the fact should certainly be noted, that three contagious diseases, of which a great number of adults and children succumb yearly in the Western countries, have not by far that same importance in this country. Cases of measles are only reported occasionally and, if so, nearly always in a mild form; diphtheria is about a bit more frequent, but not nearly to the same extent as in Europe and America, while scarletfever is practically unknown here.



CONSTRUCTION OF A WATER WORK

Of less individual interest to the European immigrant, but of great importance to the entire population and the development of these countries are the following diseases: ankylostomiasis, framboesia, beri beri, lepra, plague and small pox.

The hookworm disease occurs frequently in many parts of the Archipelago, but the number of patients, who carry these and who, without feeling exactly ill, still contribute their share to weaken the national strength as a whole, considerably, is undoubtedly extraordinarily large. In barracks, boarding schools, prisons and especially on estates and mines the hookworm is systematically and successfully fought by well controlled chenopodiumtreatment on a large scale.

A great success in combating epidemics was scored by treating framboesia with neosalvarsan, which was introduced in the Archipelago since 1919. During the last few years some hundreds of thousands of people have been cured in this way, so that in the near future, though this scourge may not be stamped out altogether, it will still belong to the rare diseases.

The time that beri-beri made its victims by the thousands, is past, thanks to the discovery of Eykman in 1891.

Still this disease occurs more or less frequently, but can always be easily

spotted and checked by carefully watching the food of the patients, especially the quality of the rice.

The number of lepers in the Dutch East-Indies is unknown: estimates vary between 25 to 125.000. The number of leprosies is about 20, to which institutions a total of 2 to 3.000 patients have been admitted. But as the stay in these homes is not compulsory, the number of patients always varies.

There are two societies for fighting leprosy: the Society for fighting leprosy in Netherlands-India and the Society „The Orange Cross", of which the first one looks after the treatment of the patients in their homes, while the second mainly gives financial aid to the leper homes. It is probable, at any rate for some of the districts, that leprosy is on the increase which will make it imperative before long to take stringent measures.

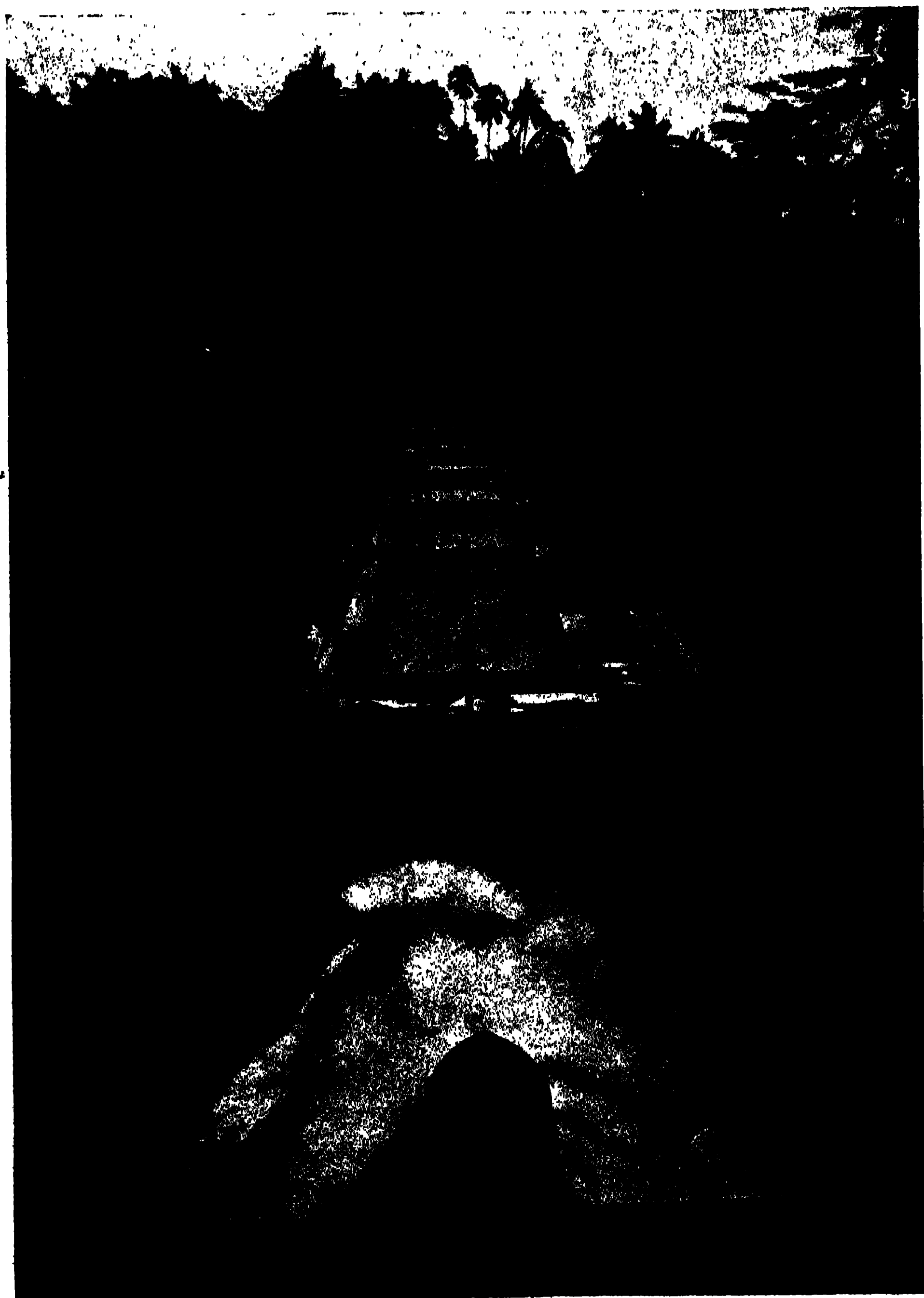
Plague appeared in Java in the latter part of 1910, reached its culminating point in 1914 (nearly 16.000 deaths), decreased in violence until 1917 (about 300 fatal cases) to increase rapidly again afterwards (nearly 11.000 death cases in 1922).

Thereby a slow shifting of the plague centres from East to West took place. In 1915 a separate service for fighting the plague was introduced. The principal method of fighting is the systematical house-improvement, which has now been carried out regularly for several years and consists of arranging the houses in such a way, that rats cannot settle in them without being noticed; also it is seen to that the houses have ample light and air. It appears, that in those districts where the house-improvement is rigorously carried out, the plague has no longer a firm footing. A second measure, though chiefly a preventive one, is the periodical claytonizing of the ships and lighters along the coasts of the plague stricken districts.

Where in former years small pox was one of the greatest plagues in this country, which swept out whole villages and districts, at present, small pox epidemics of any significance do not occur any more. The last year of a serious small pox epidemic was 1913 (with about 8.000 fatal cases), afterwards the disease rapidly declined in violence and numbers of victims everywhere. The fatal cases in 1922 amounted to 275.

Compulsory vaccination was not introduced in this country, but from the moment that vaccination was introduced here, which was at the beginning of the last century, everything has been done to carry it out as thoroughly and as systematically as possible. That it has been a great success has been clearly proved by the fact, that in many districts of the Archipelago small pox is practically a thing of the past.

The Government Vaccine Institute, existing since 1891, was removed in the beginning of 1923 from Weltevreden to Bandung into entirely new buildings. It regularly meets the demand for vaccine in the whole Archipelago. The quantity of vaccine, which is turned out yearly by this station, is sufficient for the vaccination of 8 to 10 million people and can be raised according to needs. A staff of about 400 vaccinators looks after the regular and systema-



BANJAR-TJAJANA WORKS. (RES. BANJUMAS) MAIN CANAL BETWEEN FIRSTTUNNEL AND SYPHON UNDER MERAN-RIVER.

tical vaccination and revaccination of the population; each one of them has his own districts and makes his fixed tours at regular intervals.

The Pasteur Institute is attached to the Government Vaccine Institute and is housed in the same building, where the hydrophobia treatment is applied according to the method of Pasteur, altered by Högyes.

Yearly 500 to 1.000 persons, who have been bitten by mad dogs are treated at the Institute with the wellknown brilliant results of this method. As hydrophobia is rather still frequent, the importation of dogs in the Dutch East-Indies is subject to a few restrictive conditions and in some districts even entirely prohibited.

In the Pasteur Institute furthermore different prophylactic vaccins and sera are prepared: against cholera, enteric fever, meningitis, dysentery and other diseases. Also a serum against snake.bites is prepared there, though in this country the serious effects of snake bite are not nearly as frequent as in the neighbouring countries, especially in British-India.

The measures to be taken against the introduction and the spreading of contagious diseases are laid down in the Quarantine and Epidemic Ordinances. The first one of these Ordinances refers to the introduction of contagious diseases: plague, cholera and yellow fever, (which latter disease so far has not yet been heard off in this country) from oversea, and gives directions in which way and under what conditions ports (local as well as foreign) should be declared infected, and what measures must be taken with regard to the ships, passengers and cargo, coming from such ports.

In connection with this Ordinance, large modern quarantine stations have been erected on the Island Pulu Rubiah (near Sabang) at Glugur (near Medan) and on the Island Onrust (near Tandjong Priok) to separate suspected and to treat sick cases. The Kamal Station opposite Sourabaya is nearly completed, while at Samarang a new station will be erected. Special attention is paid to the quarantine of pilgrims, who return from Mecca. The Epidemic Ordinance contains the regulations for places and districts inland with regard to plague, cholera, yellow fever, small pox, enteric fever and under certain conditions of meningitis, cerebrospinalis, epidemic bacillary dysentery and influenza.

For the treatment of the sick population there are various categories of hospitals.

In the first place the 3 large Central Hospitals at Weltevreden, Samarang and Sourabaya, in each of which the daily number of patients amounts to 5 to 600. The establishment at Weltevreden, an entirely new and modern building, was taken in use in 1919.

These hospitals are also used for the training of medical students and nurses.

In the second place there are Public Hospitals, numbering about 100, spread over the Archipelago, sprung from the old native hospitals.

At the head of these is a Civil Doctor, a Government Native Doctor or in some cases an Army Medical Officer. Both these categories are Government Hospitals.



INTAKE PESAJANGAN. (RES. PEKALONGAN)

During the last ten years there has been a tendency to transfer the individual medical treatment as much as possible to the provinces or private bodies with a strong financial support by the Government.

This tendency has resulted in the creation of the following categories of hospitals.

1. Provincial and Municipal Hospitals (at Bandung, Sukabumi, Cheribon, Tasikmalaja, Garut, etc.).

2. Subsidised private hospitals and nursing homes, which are the property of and are managed for the greater part by the various missionaries and by other organizations.

A special place is occupied by the workmen's hospitals.

These are partly Government (Banka, Sawah Luntoh, Pulu Laut), partly private institutions. The latter have been brought to an especially high degree of perfection in the agricultural district of Sumatra's East Coast, where during the last 20 years the care for the healthy and sick estate workmen has really become a model for the other districts.

The yearly death rate among the workmen there, has been reduced from 60 or 70°/°° to 10 or 12°/°°.

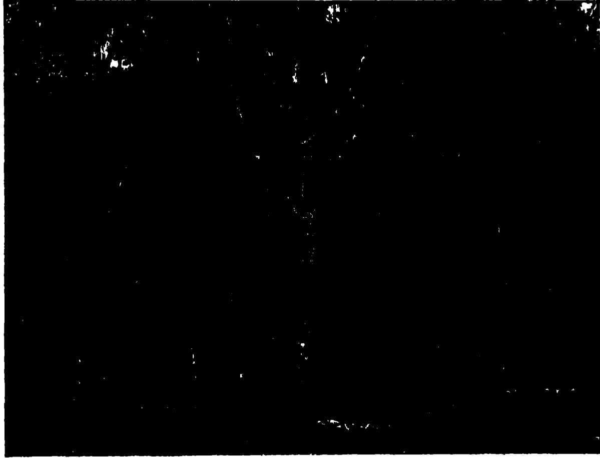
These favourable and often even still lower figures of mortality one finds back in all well organized and managed workmen centra (Banka, Billiton and others).

In this connection the Coolie Ordinance should be mentioned, whereby the labour conditions and the regulations with regard to the care for the workmen are fixed and the service of the Labour Inspection, which sees to these terms and stipulations being carried out.

In late years a few hospitals have been built under certain conditions for joint account of the Government and the planters.

For eye patients there are Government hospitals at Bandung and Ngawi, and private subsidized clinics in Djokjakarta, Samarang and Sourabaya. Furthermore in the three Central Public Hospitals there are also ophthalmatic departments.

There are subsidized private Maternity Homes in Weltevreden, Surakarta, Sourabaya and Cheribon. With the hospital system is closely connected the treatment of outdoor patients, which during the last 20 years has been largely extended by the Government as well as by private bodies and for which the native population has shown increasing interest during late years. Well-to-do patients find excellent private nursing homes in most of the big cities, while also in the large military hospitals, private patients are admitted against payment.



CINCHONA PLANTATION

As regards the treatment of lunatics, the following may be observed.

The Lunatic Asylum at Buitenzorg was opened in 1882, the one in Lawang in 1902. The first one now shelters about 1.200 patients, the second about 2.500.

A third large asylum is being erected at Magelang and will be occupied shortly.

Temporary asylums under expert management for serious cases and other patients, who require immediate attendance, were established in 1918 at Sourakarta, in 1920 at Batavia, while in 1921 a section of the Lunatic Asylum at Lawang was also reserved as a temporary home.

Temporary asylums at Palembang and Macassar were completed a little while ago, while the old military hospital at Sabang will be occupied still this year as a lunatic asylum for North-Sumatra.

The care for all these matters, concerning the public health, is entrusted to a separate service, the Civil Medical Service, of which the principal seat is at Weltevreden. The task of this service may be described as follows:

1. The practice of the Medical State Supervision, which in general includes the examination as to the state of the public health, also the planning and the application of means for improvement.



PLOUGHING OF A RICE FIELD

2. The promotion of and the interference with the individual medical treatment, comprising:

a. The promotion of a proper medical treatment of the population on a European base.

b. The charge of medical attention to certain groups of people.

The Service is in charge of a Chief Inspector. Inspectors are appointed for the various districts, who together have a staff of 120 government physicians and 200 native physicians.

An important item of the Civil Medical Service is the charge of recruiting the medical and other personnel.

As the importation of a staff from Europe does not by far meet the demand here and is very costly, a start was made in the middle of the last century with the training of medical students in this country. At present there are two excellently organized medical schools (one in Weltevreden and one in Sourabaya), which together train about 400 students.

Besides the medical training there is also an opportunity to be trained as a native male or female nurse.

After obtaining their certificate, the graduates may continue their studies to obtain the certificate of laboratory assistant, midwife or head nurse. This course is given in the Central Medical and other hospitals, and is very popular, while on the whole the results are very favourable.

Furthermore there are courses for the training of chemist's assistant,

laboratory assistant, inspector for the Public Health Department and vaccinators.

A short survey like this one is, cannot be closed without mentioning the various laboratories for the benefit of the public health.

A trip by Professor PEKELHARING and Dr. WINKLER to this colony in 1886 gave the impulse to the foundation of a separate Civil Medical Laboratory, which for the time being was accommodated in the buildings of the Military Medical Service, but was transferred in 1917 to a magnificent new building also at Salemba (Weltevreden).

The Medical Laboratory is since 1911 under the management of the Civil Medical Service and is divided in a Section A for hygiene, bacteriology, parasitology, pathology and tropical physiology, and a section B for chemistry, pharmacology and toxicology.

In the Laboratory the most divergent researches are carried out in the interest of the public health.

Furthermore there are smaller provincial laboratories in Samarang and Sourabaya.

A separate place is occupied by the Pathologic Laboratory at Medan, which in contrast with the above mentioned Government institutions is a private one. Originally (1908) founded by a few large tobacco plantations on the East Coast of Sumatra, as an expedient in the fight against the many diseases, which threatened the labourers of these companies, it has by and by become the centre for medical hygienic researches of a large part of Sumatra's Northern half, not only for the labourers but also for the other part of the population.

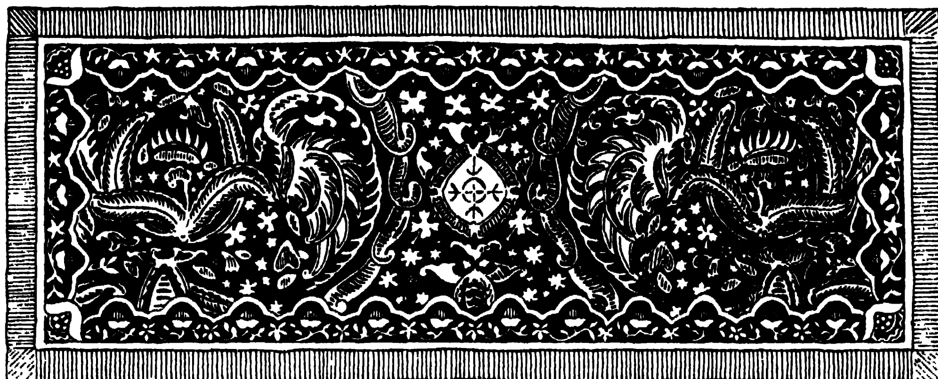


MONETARY SYSTEM AND BANKING.

The Monetary system

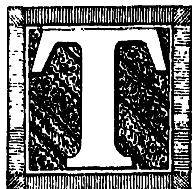
Banking institutions

Popular credit institutions.



CHAPTER VI

THE MONETARY SYSTEM.

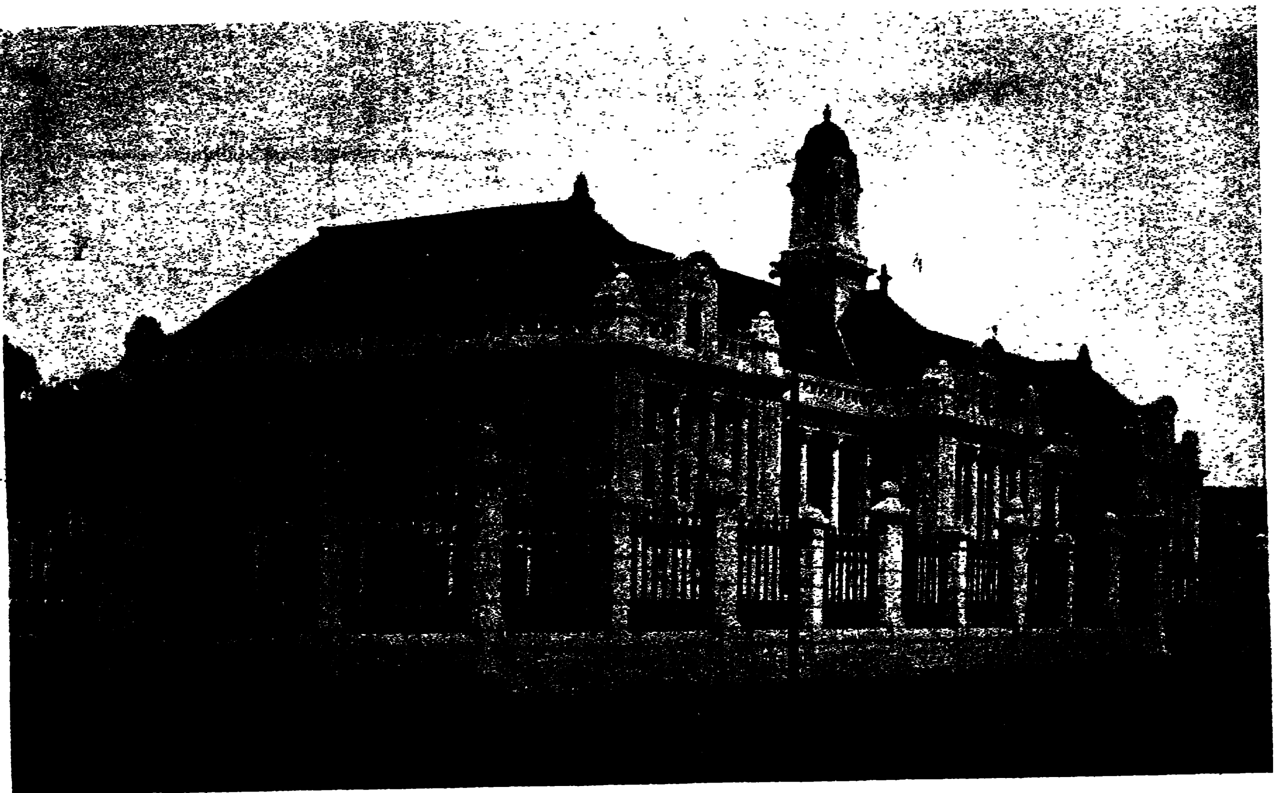


The monetary system in the Netherlands is uniform with that of the Dutch East Indies. Both systems have the same standard gold and silver coins, which are legal tender to any amount. In order to understand clearly the nature of the monetary system in the Dutch East Indies, it is necessary to refer to the Dutch Coinage Act of 1901, which has been revised and amended several times, the last time by the Act of November 27th, 1919. The text of the Act is again published in the Official Gazette 1912, No. 611. In this Act the value of the guilder is fixed at one tenth part of the golden ten guilder piece.

According to the Act of 1901, the golden ten guilder piece contains 6.048 grams of pure gold, the silver guilder 9.45 grams of pure silver, so that the relative value of gold to silver is as 94.500 : 6.048 or as 15.625 : 1. Since the revision of 1919 however, the weight of pure silver in a silver guilder has been reduced to 7.20 grams, so that for coins, struck since that year, the relation of gold to silver is as 11.905 : 1.

The minting of gold is free, while silver coins may be minted only by the Government, and then under certain limitations, so that only as much silver may be minted as is necessary for circulation in Holland and its Colonies. The Dutch and Indian Coinage Acts, therefore, only permit the minting of 2½ guilders, guilders and ½ guilder pieces for the purpose of replacing the Dutch or Dutch East Indian coins, which have been withdrawn from circulation by the Government, while for the minting only the silver of the coins withdrawn may be used.

The Crown has the right to lift the embargo on the prohibition of minting 2½ guilders, guilders, half guilders and silver change, other than from the silver of melted Dutch East Indian coins, whenever the needs of the currency in Holland and the Dutch East Indies make such a step desirable. The sums required for the purchase of silver must be entered separately in the budgets of Holland and of the Dutch East Indies and must be fixed by law.



THE JAVA BANK AT BATAVIA.

To maintain the gold value of the silver coin, certain provisions have been made. If it appears that so much silver is in circulation that there is danger of the value of the gold is decreasing, the Minister of Finance is empowered to melt into bars an amount up to 25.000.000 guilders of Dutch 2½ guilder pieces and to sell these bars through the agency of the Netherlands Bank. In order to cover the loss, caused by the withdrawing of silver coin from circulation, the profits arising from the minting of pure silver have, since 1913, been administrated as a separate fund, the interest of which is added continuously to the capital.

In its endeavour to maintain the specie-parity of its currency on foreign markets, the Government is assisted by the Netherlands Bank. This Bank pledged itself in 1904 to hold ready for export its entire stock of gold at a price which would prevent any possible rising of the exchange beyond the gold point.

The Directors of the Netherlands Bank at that time assumed the following obligations toward the State:

„The Directors of the Netherlands Bank bind themselves toward the „Government to maintain the gold policy hitherto pursued by them, by „offering for sale fine bar gold at the price of glds. 1.653.44 per Kg., and „minted gold at a corresponding price, as soon as the exchange rates on foreign „markets rise beyond gold point, and to continue doing so, as long as its stock „of gold will permit".

This is in force only during normal times and not for the extraordinary circumstances created by the world war. The policy of the Netherlands Bank with regard to Holland, is followed by the Java Bank with regard to the Dutch East Indies, although in a somewhat different way.

At the end of December of the years indicated below, the following (estimated) amounts of legal tender were circulating in the Dutch East Indies:

	SILVER	NICKEL	COPPER	BANKNOTES
1919	glds. 446.000.000 (excl. glds. 9.000.000 currency notes)	glds. 3.000.000	glds. 14.000.000	glds. 310.000.000
1920	glds. 457.000.000 (excl. glds. 46.000.000 currency notes)	„ 3.000.000	„ 15.000.000	„ 369.000.000
1921	glds. 470.000.000 (excl. glds. 52.000.000 currency notes)	„ 5.000.000	„ 17.000.000	„ 281.000.000
1922	glds. 480.000.000 (excl. glds. 43.000.000 currency notes)	„ 6.000.000	„ 17.000.000	„ 261.000.000
1923	glds. 480.000.000 (excl. glds. 41.000.000 currency notes)	„ 6.000.000	„ 17.000.000	„ 260.000.000



NATIVE DWELLING IN JAVA

THE JAVA BANK.

Among the banking institutions, the Java Bank occupies a special position. It is the Circulation Bank of the Dutch East Indies. The right to act in this capacity was granted by the Java Bank Charter of 1922 (Official Gazette No. 180).

This charter grants the Java Bank the exclusive right, for a period of 15 years, to issue notes in the Dutch East Indies, provided they are of no lower denomination than glds. 5.—.

The notes now issued are of the following denominations: glds. 1.000.—, 500.—, 300.—, 200.—, 100.—, 50.—, 40.—, 30.—, 25.—, 20.—, 10.—, and 5 —.

The issue of notes is not limited to any maximum figure, but the Bank's liabilities, i.e. the total amount of the outstanding banknotes and bankdrafts, plus the amount of the deposits, must be covered by coin and bullion to an extent of 40% (since the Ordinance of August 5th, 1914, Official Gazette No. 538 to an extent of 20%). Of this metal reserve, at least three quarters must be held in the Dutch East Indies, while at least half of this obligatory metal reserve must consist of standard coins of the Dutch East Indies.

The banknotes issued by the Bank are legal tender (Ordinance of August 5th, 1914, Official Gazette No. 537).

The Java Bank may not grant an open credit to anyone whomsoever; it may not interest itself in any commercial, industrial or other undertaking and is not allowed to purchase its own shares or to grant loans against the security of these. It may not deal in real estate, and may not make advances on the security of ships. It does not allow interest on credit balances in current account.

In all places where it has offices, the Java Bank acts free of charge as Government banker. It also acts free of charge as banker to the Postal Savings Bank in the Dutch East Indies and as custodian of the securities of this institution.

The Java Bank furthermore takes all possible care of the circulation of currency in the Dutch East Indies. It assists the Government in the issue and distribution of standard silver coin, subsidiary coin and currency notes. It promotes the movement of currency by means of giro transfers between accounts kept at its various offices and has established a daily clearing in the principal towns: Batavia, Sourabaya, Samarang, Medan, Bandung and Macassar.

To the best of its ability, the Java Bank strives to maintain the gold parity of the home silver and paper currency in relation to foreign currencies.

For this purpose it invests part of its resources in foreign bills, and keeps gold deposits and balances both in Holland and with its correspondents in London, Berlin, New-York, San Francisco, Yokohama and Singapore. Whenever the maintenance of the gold parity of the Dutch East Indian guilder requires it, the Bank buys or sells foreign bills and increases its gold deposits



PLANTING OF RICE

and balances in foreign countries, or it reduces them by placing gold at the disposal of the public and by ordering payments in foreign countries. The embargos placed on the free movement of gold in most countries and the refusal of nearly all central Issue Banks to meet their liabilities in gold, are for the present seriously interfering with the policy of the Java Bank in trying to maintain, under all circumstances, the parity of exchange between domestic and foreign currencies.

The working sphere of the Java Bank as the central institution in the monetary and credit system of the country has gradually expanded in proportion with the growing economic development of the Dutch East Indies, and by using all means in its power, has secured, since the outbreak of the war in 1914, as much as possible the undisturbed working of commerce, industry and agriculture.

The Bank's discount rate has been standing at 3½% since August 1st, 1909.

The Java Bank publishes a weekly statement of its position in the Official Gazette.

The Head Office of the Java Bank is established at Batavia. It has also offices at Bandung, Sourabaya, Samarang, Cheribon, Surakarta, Djokjakarta Malang and Kediri; in Sumatra at Medan, Tandjong Pura, Tandjong Balei, Bengkalis, Kota Radja, Padang, Palembang and Pematang Siantar; in Borneo at Bandjermasin and Pontianak; in Celebes at Macassar and Menado. A branch office is established at Amsterdam.

The Java Bank was established as a private institution in 1827, by Government Decree of December 11th (State Gazette 111) and was converted into a limited liability company in 1881 by notarial deed, dated March 22nd, in conformity with the regulation of the Dutch East Indian Code of Commerce.

The capital of the Bank amounts to glds. 6.000.000.—, divided into shares of glds. 500.— and glds. 250.—. All shares are registered stock, they are fully paid up and are owned by private individuals.

Shortly the capital is to be increased to glds. 9.000.000.—, in fully paid up shares.

The Government, though not a shareholder, shares in the Bank's profits.

The management of the Bank is in the hands of a Directorate, established in Batavia and consisting of not less than three members, viz. a President, one or more Directors and a Director-Secretary. They are appointed for five years by the Government, from a nomination made up by the Directors and Commissioners.

Only in case of the appointment of a President the Government has authority to deviate from this nomination.

For supervision, a Council of Commissioners consisting of five members, is elected by the shareholders, in addition to which a Government Commissioner is appointed by the Governor-General.

On March 31st., 1923, the Reserve Fund amounted to glds. 6.183.792.97.

OTHER BANKING INSTITUTIONS.

Besides the Java Bank, the circulation bank of the D. E. I., there are several other private banking concerns, of which the principal ones are:

The Netherlands Trading Society;
The Netherlands India Commercial Bank;
The Netherlands India Discount Bank;
The Union Bank for the Netherlands and Colonies;
The Bank for India;
The Chartered Bank of India, Australia and China;
Hongkong and Shanghai Banking Corporation;
The Bank of Taiwan Ltd.;
The Yokohama Specie Bank Ltd.;
The International Banking Corporation.

The Netherlands Trading Society.

This institution dates back to 1824 and was founded at the initiative of King William I.

Originally branches were established in the U. S. A., China, Hindostan, Persia, Arabia and the eastern Mediterranean seaports, but later on the operations of the Company were concentrated in Java.



HEAD-SLUICE SINGOMERTO AND MAIN CANAL (RES. BANJUMAS)
IN THE BACKGROUND SCOURING SLUICE SINGOMERTO

Ever since the foundation of the Bank, the D. E. Indian products, belonging to the Government, were sold in Amsterdam, but with the gradual repeal of the compulsory cultures, the Netherlands Trading Society also had to alter her course and thus she began in 1883 to specialize more particularly in the banking and exchange business.

This gave the impulse to the tremendous growth of the company, which enabled her to reach her present position. The company opened up new offices also outside the Dutch colonies especially in various places in Asia.

The fully paid up capital of the Netherlands Trading Society amounts to glds. 80.000.000.—, while the reserves and extra reserves at the end of 1922 amounted to round about glds. 42.000.000.—.

The Head Office of the Company is established in Amsterdam, while the Head Office for the East Indies is in Batavia.

The Netherlands Trading Society is now the biggest bank in the Netherlands East Indies and at the same time the biggest and oldest agricultural bank. She is not purely an agricultural bank, her operations extend to any field, which is open to a banking institution and the cultures only form a division of her extensive operations.

Of the large capitals, which the Society controls, only a relatively small percentage is invested in estates, but this small percentage turns over a large share of the annual profits.

The Netherlands India Commercial Bank.

The Netherlands India Commercial Bank was established in 1863. In contrast with the Netherlands Trading Society, which was founded for purely commercial purposes, the Netherlands India Commercial Bank was the first institution, which was established, as stipulated in the memorandum of association, to do banking business on a most extensive scale, to finance agricultural estates, to take part in the floating or to float undertakings of a commercial or industrial nature.

The activities of the Netherlands India Commercial Bank during the first twenty years of her existence were mainly concentrated on estate business; she was closely connected with many sugar estates and coffee estates. In 1884 the banking business was separated from the estates business, by incorporating all the estate interests in the Netherlands India Agricultural Company, of which the entire shares capital of glds. 12.000.000.— is in the hands of the Netherlands India Commercial Bank.

The capital of the Netherlands India Commercial Bank at the end of 1922 amounted to glds. 55.000.000.— and the reserves to about glds. 20.000.000.—. The Head Office is established in Amsterdam, while the Head Agency for the East is in Batavia.

In her present state the Netherlands India Commercial Bank is purely a bank and does exclusively banking business.

Branches are found in every place of some importance in the D. E. I., while also she has branches in Bombay, Calcutta, Hongkong, Kobe, Shanghai and Singapore and further correspondents all over the world.

The Netherlands India Discount Bank.

This institution has no agricultural interests and does exclusively banking business. The bank was founded at Batavia in 1857 with a capital of glds. 1.000.000.—. At the end of 1922 the capital amounted to glds 50.000.000.— of which glds. 47.000.000.— was paid up and reserves of glds 12.000.000.—. The Head Office is established at Batavia, while there are branches in Amsterdam and the Hague and also in the more important places of D. E. I.

In the smaller places the bank has correspondents.

Union Bank for Holland and Colonies.

This bank was founded in Amsterdam in 1914, where at present is also the Head Office. The capital issued amounts to glds. 10.000.000.—.

This institution has several branches in Holland and six in the D. E. Indies. The bank has no agricultural interests and does purely banking business.

Bank for India.

This Bank is the youngest bank in the D. E. I. and was founded in 1920. The capital amounts to glds. 50.100.000.— of which glds. 12.600.000 has been paid up.



HARVESTING OF A RICEFIELD IN THE ISLE OF BALI

The Head Office for Europe is in Rotterdam, the one for the East in Batavia. The Bank has, besides the Batavia Head Office, three branch-offices in the D. E. Indies.

The bank is closely connected with the „Rotterdamsche Bankvereeniging" and like this bank does pure banking business; this bank specializes in placing loans for Dutch East Indian Boroughs.

Of the foreign banks the following should be specially mentioned:

1. The *Chartered Bank of India, Australia and China*, which opened an office in Batavia in 1863 and therefore also belongs to the oldest banks, represented in the D. E. Indies. The bank dates back from 1853 and has her Head Office in London and nearly forty branches and agencies in British-India, Ceylon, Straits Settlements, China, Japan and the D. E. Indies. The fully paid up capital of the bank at the end of 1922 was £ 3.000.000.— and a reserve fund of £ 3.700.000.—.

2. The *Hongkong and Shanghai Banking Corporation*. This bank was founded in Hongkong in 1867 and opened her Batavia Office in 1884. The Head Office of the Bank is in Hongkong, the Head Office for the Dutch East Indies in Batavia, while the bank has also branches and agencies in Cheribon, Samarang and Sourabaya. Furthermore about 40 branches are established especially in China, Japan and British-India.

3. The *Yokohama Specie Bank* and

4. The *Bank of Taiwan* with their head offices respectively at Yokohama and Taipeh (Formosa) handle a great part of the export business with Japan and are the bankers of the many Japaneses who are spread over the whole of the D. E. I. The Yokohama Specie Bank with a paid up capital of Y. 100.000.000. has branches at Batavia and Sourabaya and some forty more, especially in Japan, China and Br. India. The Bank of Taiwan with a paid up capital of Y. 60.000.000 has branches at Batavia, Samarang and Sourabaya and some thirty especially in Japan, China and British-India.

THE SAVINGS BANKS.

Next to the Postal Savings Bank and the local native savings banks, which offer the population the facility to save, one finds in the D. E. I. several private savings banks, of which the principal ones are:

The Batavia Savings Bank, the General Savings and Deposit Bank in Batavia, the Savings Bank in Bandung, the Savings Bank in Samarang, the Savings Bank of the Society of General Benefit in Sourabaya.

Europeans are the chief clients of the private savings banks, while the Postal Savings Bank has twice as many native depositors as European ones.



HARVESTING OF COFFEE-BERRIES

The Postal Savings Bank.

The Postal Savings Bank, which has its seat at Weltevreden (Batavia) started operations July 1st, 1898.

This institution is incorporated by law and has a separate revenue independent of the Government resources.

The Director of the Postal Savings Bank, who is subordinate to the Director of Government Services, represents the institution and is responsible to a Committee of Trustees.

The service is carried through the post offices and most of the branch offices, and also, by way of trial, in a number of Government pawnshops in East Java. The number of offices accepting deposits, at the end of 1922 amounted to 639, i.e. 149 post offices, 417 branches and 73 pawn shops. The savings-books are registered in the name of the holders, the interest amounts to 2.4% per year, but only a maximum deposit of glds. 2.400 of one subscriber is interest bearing. Since January 1st, 1923 depositors may call in the intermediance of the Postal Savings Bank for the purchase of interest bearing D. E. Indian Government bonds and if required also for the custody, the collecting of interests and the sale of the said bonds purchased.

The available moneys of the Government Savings Bank must serve as much as possible for the benefit of the credit needs of the Dutch East Indies.

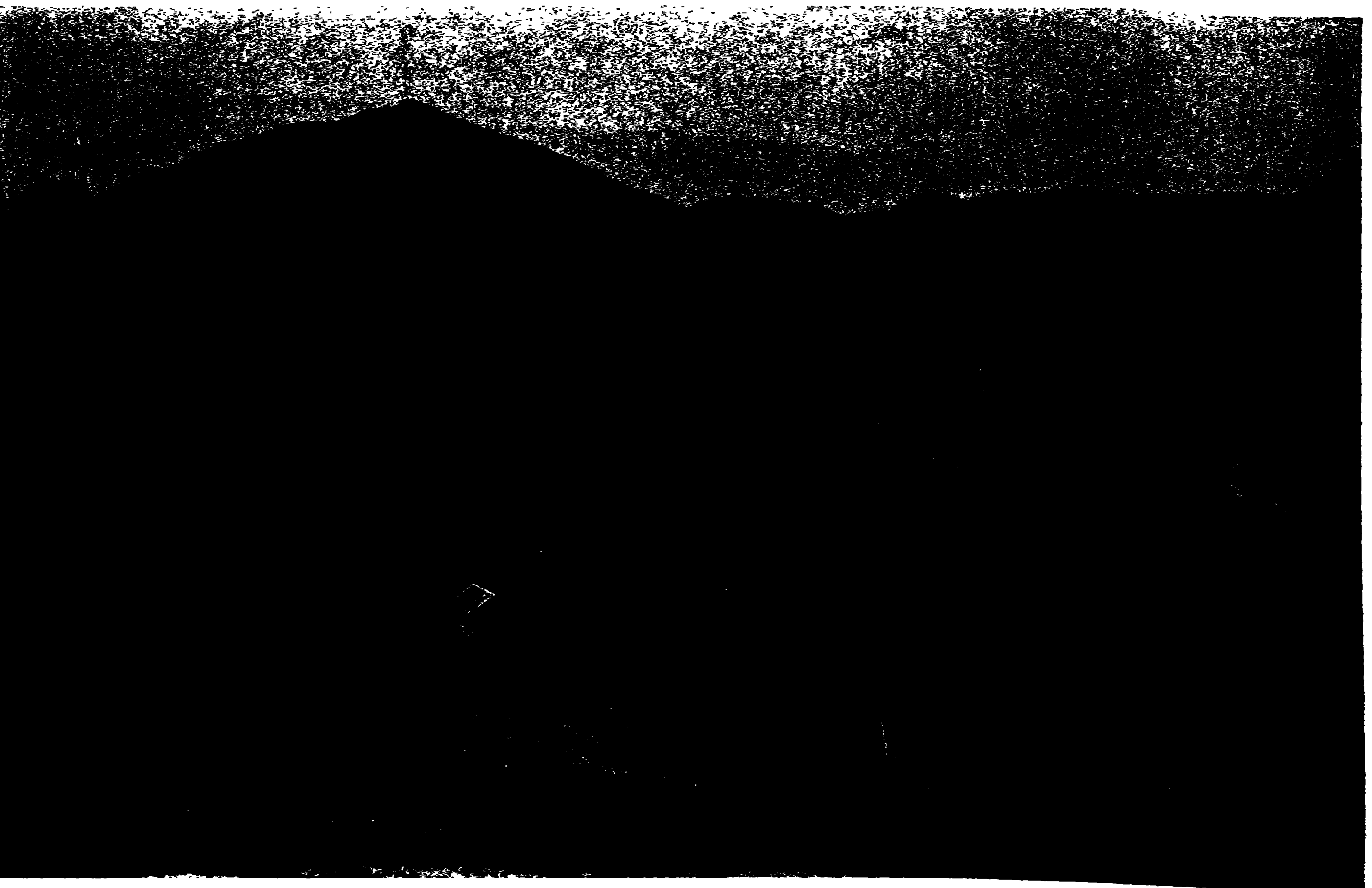
Following are some statistical data regarding the work of the Postal Savings Bank:

a. division and total of the number of deposit books (Europeans series A, natives series B and Foreign Orientals series C) and the percentage proportion to the total at the end of the last three years.

	A	B	C	TOTAL	PERCENTAGE A	PERCENTAGE B	PERCENTAGE C
1920	71.897	121.964	12.499	206.360	34.84	59.10	6.06
1921	74.084	138.301	13.314	225.699	32.82	61.28	5.90
1922	75.772	150.479	13.800	240.051	31.56	62.69	5.75

b. **Division and the total of the assets (in 1.000 guilders) of the depositors at the end of the last three years and the percentage compared with the total.**

	A	B	C	TOTAL	PERCENTAGE A	PERCENTAGE B	PERCENTAGE C
1920	14.084	4.483	684	19.251	73.17	23.28	3.55
1921	14.186	5.049	712	19.947	71.12	25.31	3.57
1922	14.186	5.032	640	19.858	71.44	25.34	3.22



SCENERY WEST COAST OF SUMATRA

c. Total amount (in 1.000 guilders) of the deposits and refunds at the end of the last three years.

	DEPOSITS	REPAYMENTS	TURNOVER DEPOSITS AND REPAYMENTS
1920	17.469	12.490	29.959
1921	16.297	16.025	32.322
1922	14.119	14.621	28.740

POPULAR CREDIT INSTITUTIONS.

The organization of the popular credit system by the activity of the Government dates from 1900.

Some forms of co=operation have existed for many years in the Colony sometimes entirely by the initiative of the people themselves, sometimes as a result of the encouragement of European officials. Already in the beginning of the 19th century the Government encouraged the storing of rice in the villages, both to lessen hardships and to procure seed paddy.

The popular credit system now in vogue, was founded on the principle of some already existing institutions, and comprises at present three kinds of credit and savings banks:

1. the village rice credit banks (desaloemboengs).
2. the village money credit banks (desabanken).
3. the provincial, divisional or district banks.

1. *The village rice credit banks.*

These institutions, established by one or more communities, are owned by the Native community and were, for the most part, founded at the expense of the farmers. The chief of the Provincial Government draws up the regulations for the establishment and management. The contributions toward the founding come from members of the community in kind or in the form of labour and money. As soon as possible the contributions are returned from the profits made. For the most part this has already been done. In cases where the means of the inhabitants were insufficient, the Government, in exceptional cases, advanced, free of interest, loans of rice or even of money for the purchase of building materials.

The rice lent out by the banks is paid in kind with an addition of maximum 50% by way of interest, which is reduced as soon as the debts contracted by the bank have been paid off, the stock of rice brought to its proper level and a reserve fund formed. In most of the banks the rate of interest is already

reduced to 25/35%. A part of the rice is sold each year, if necessary, to meet the expenses of administration from the proceeds; besides, by the sale of superfluous rice, after the debts are paid off, a reserve fund is formed which is invested in the popular or division bank. By this means the Native community comes into possession of a free hold building with a stock of rice and a reserve fund in money, and the farming population may obtain, against a moderate interest, rice for its sustenance and for other needs. The directors, who enjoy part of the profits, consist of three farmers and the village chief, while for the bookkeeping, as a rule a competent person is appointed for several villages together, each of which he visits in turns. The institution largely prevents the buying up of the harvest by dealers, with the consequent decrease of prices before and increase after the purchase, and keeps the price constant. Only in those places, where rice-growing is the chief means of livelihood, these institutions are necessary. If the people, however, have other sources of income from trade, industry or fishery, the storage of rice is less urgent. The improvement in transport facilities also lessens the need for paddycredit, because in times of rice shortage or crop failure, the import from other parts of the country may be effected more easily than before. The number of rice storehouses is therefore decreasing and financial credit banks are taking their place.



HARVESTING OF KAPOK FRUITS

In the Outer Districts at the present time, no more desaloemboengs are to be found.

2. *Village Financial Credit Institutions.*

These savings and credit institutions are established for the use of one or more villages and are run on the same lines as the rice credit institutions. The working capital is composed of the capital accumulated from the profit

and for a small part also of the deposits made by residents, who are interested in the concern, advances from the desaloemboeng funds, other village capital or loans from the Divisional Banks. In several banks the borrowers are required to pay a certain sum in addition to the loan plus interest, which sum is booked as their deposit and is only repaid under certain conditions.

Since only small amounts are borrowed, generally not more than glds. 25.—, the high rate of interest, from 24 to 30% per annum, is in reality not excessive.

Although legally a community institution, the bank sometimes has the character of a co-operative society. Most of these banks have a current account with the divisional or residency banks, for the purpose of borrowing working capital or the depositing of superfluous cash.

Although the turnover of the village banks is at present still small, there is reason to believe that gradually they will become the main credit banks of the small farmer, trader and manufacturer.

3. *District, divisional or provincial banks.*

The working area of these banks, intended for Natives and non-Natives, in Java usually covers an administrative division, in the Outer Districts often a whole province with a population of from 250.000 to 1.000.000 inhabitants, while many, of the banks have branch-offices.

The institution is an incorporated society, under the supervision of a board consisting of official and non official Europeans and Natives of good social standing.

Profit making for the benefit of the directors is excluded, the board of Directors give their services free of charge; the bank is conducted, however, on the strictest business principles.

The work of administration is in the hands of a responsible manager, who is assisted by a staff of Europeans and Natives.

As long as it is necessary, the Government supports the banks with subsidies for the expenses of administration.

Originally, money was furnished by the Government for working capital. Since the establishing of the „Central Cash" on January 1st, 1913, these subsidies have ceased, with the exception of amounts which, through the medium of the banks, are supplied by the Government for measures of an economical nature, to which extraordinary risk is attached and for which the Central Cash has no money available, c.q. for colonisation.

With a few exceptions, these banks have no capital of their own outside the reserves formed. They are therefore extremely eager to acquire an ample reserve as soon as possible.

The working capital, as far as it is not owned by the bank, consists of deposits by private individuals, Native communities and local unions and money borrowed from the Central Cash:

a. Deposits, repayable at 6 to 12 months notice and which bear 6% interest per annum, mostly from Europeans.

b. Savings, withdrawable without notice, bearing 4% interest p.a.

c. Sums in current account from village banks, Native corporations, individuals and public institutions, bearing from 2 to 4% interest p.a.

d. Sums in current account lent by the Central Cash at a rate of interest which has to be fixed annually (now 6%). The money is chiefly lent for productive purposes, for agriculture, trade, fishery, the redemption of mortgaged land and crops, the building of houses and, to a limited extent, for non-productive purposes. The rate of interest charged by the bank varies from 12 to 24% p.a.



OILPALM IN FULL BEARING

In order to enable the peoples banks to enforce their claims, they are empowered by law to get a lien on real estate, which is held in possession according to the Native law. Such a lien partakes of the nature of a deed of mortgage and is called a credit lien. The advantage of this lien is that it leaves the debtor the usufruct of his possessions and prevents his impoverishment. An actual contract cannot be made with the divisional banks, these being considered by law a European incorporation and according to Dutch East Indian Law, no European can lay claim to lands owned by Natives.

The mortgaging of land which has been mortgaged by such a lien is illegal and void.

In 1919 divisional banks were found in all divisions of the Government land in Java, except in one, besides in Surakarta.

In the Outer Districts they are found in all provinces with the exception of four.

In some provinces of these Districts the credit system has developed along different lines, since decentralization has been introduced and the active co-operation of the Natives is greater.

In some places of the Lampong Districts and on the North Coast of Java, where seafishery is the source of livelihood, credit banks have been established on behalf of the people, in connection with which a co-operative fishmarket is run.

4. *The Central Cash for Popular Credit.*

This institution, incorporated and established at Batavia, is capitalized by the Government, which has agreed to increase the original capital till it reaches the sum of glds. 5.000.000.

This bank serves a twofold purpose, i.e. it provides the peoples banks with working capital, as well as giving an opportunity for investing their funds and it advises and assists them in their management.

The Government has furthermore the means to control the credit banks through this institution.

The management consists of an official as Director and a Board of Super=vision appointed by the Governor=General. The staff consists of civil servants, whose salaries are paid by the institution.

The Central Cash provides the peoples banks with auditors, for whose services a fixed fee is charged. It gives credit only to well managed institu=tions and stands guarantee for the repayment of deposits.

The Governor=General may entrust the Central Cash with the bookkeep=ing and administration of funds, which have been placed at its disposal for the promotion of the people's welfare.

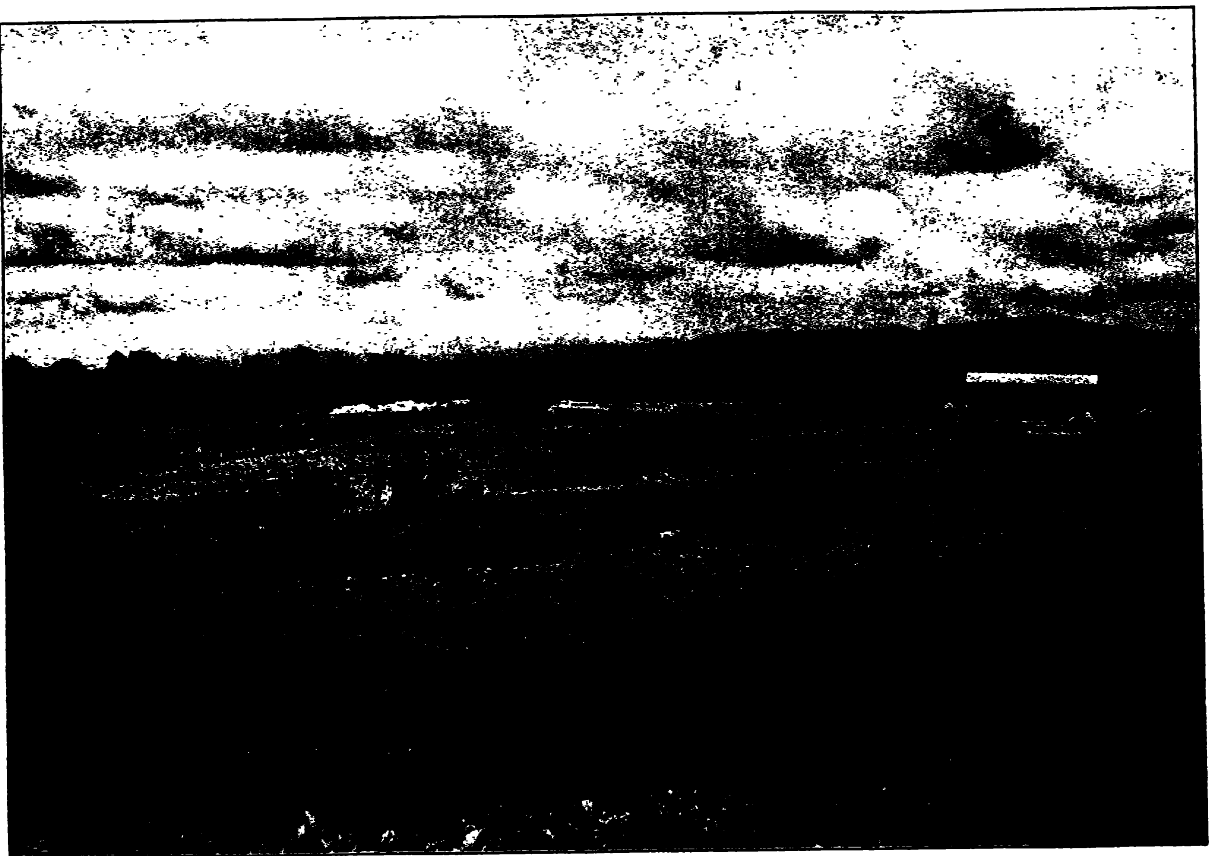
At the end of the year 1922 the capital of the Central Cash amounted to glds. 2.875.250, supplied by the Government at a rate of interest of ± 3.2% and an amount of glds. 549.122, advanced by the Government free of interest.

The district banks had at that moment glds 3.826.900 invested in current account and an amount of glds. 2.034.000 in stock with the Central Cash in deposit.

Up to the end of 1922 the Central Cash had granted credits to 64 Divisional banks to an amount of glds. 6.431.000.—.

DIVISIONAL BANKS.

END OF BOOKYEAR	NUMBER			WORKING CAPITAL	NET CAPITAL	BALANCE OF OUT-STANDING LOANS	MONEY WITHDRAWN	
	JAVA	OUTER DISTRICTS	TOTAL				IMMEDIATE-LY WITH-DRAWABLE	WITH TERM OF WITH DRAWAL
1911	70	3	73	9.992.000	942.000	8.110.000	1.743.000	7.622.000
1914	73	7	80	19.585.000	2.207.000	16.367.000	6.472.000	11.545.000
1918	70	13	83	32.362.000	4.140.000	25.216.000	12.458.000	17.590.000
1922	70	16	86	55.149.000	7.047.000	40.723.000	21.556.000	23.274.000



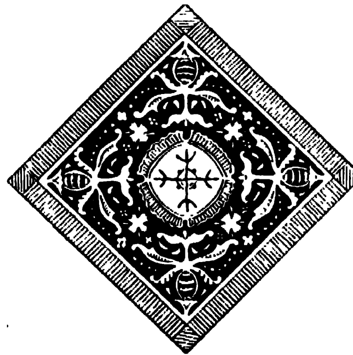
TEA GARDENS AND TEA FACTORY

VILLAGE BANKS.

ULT. DEC.	NUMBER JAVA	OUTER DIS-TRICTS	TOTAL	AMOUNT OF OUTSTANDING LOANS	DEPOSITS OF NATIVES	NET CAPITAL
1911	904	2	906	603.000	200.000	201.000
1914	1.676	535	2.205	1.278.000	577.000	702.000
1918	2.037	777	2.814	1.717.177	826.943	1.745.806
1922	2.823	503	3.326	3.187.000	624.000	3.448.000

RICE-BANKS.

ULT. BOOKYEAR	NUMBER			NET CAPITAL	
	JAVA	OUTER DISTRICTS	TOTAL	IN RICE (K.G.)	IN MONEY (GLDS)
1911	12.630	80	12.710	146.618.240	528.000
1914	12.206	293	12.504	158.352.640	3.654.000
1918	10.385	—	10.385	167.122.560	5.321.000
1922	8.310	—	8.310	131.750.000	8.692.000



AGRICULTURE, FORESTRY ETC.

The obtaining of long-lease rights

Immigration

Labour inspection and recruiting of coolies

Agriculture

Agricultural education

Agricultural Extension service

The Government Rubber industry

The Government Gutta percha plantation

Irrigation

The forestry service



CHAPTER VII

THE OBTAINING OF LONG=LEASE RIGHTS.

I. In territory under direct Government control.

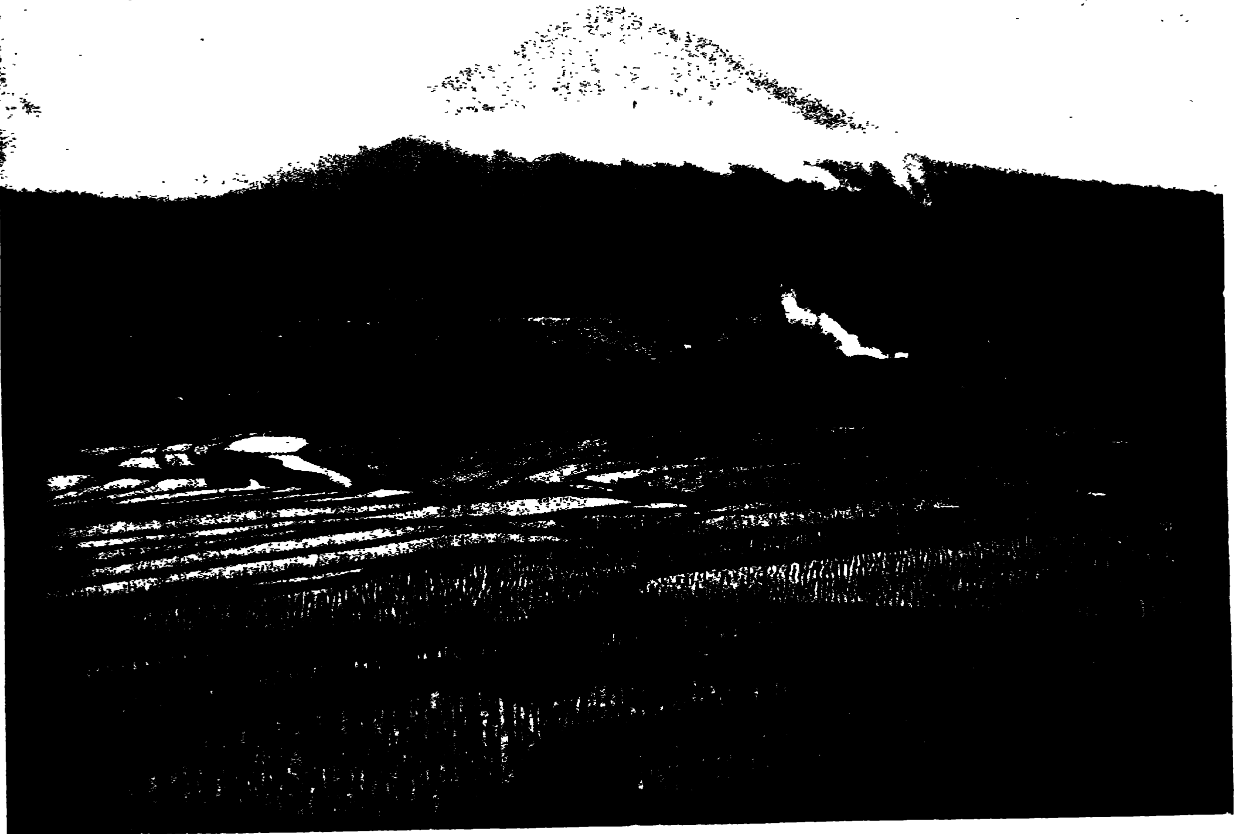


riginally, in the Dutch East Indies, land was leased for private agriculture, if suitable for this purpose and if not cultivated by the Natives or used as communal meadows or if did not, in some other respect, belong to the villages.

The difficulties resulting on the one hand from the short term of the lease (at the utmost 20 years, for the cultivation of coconuts 40 years), on the other hand, from the fact that the personal character of the lease did not allow the estate to serve as mortgage for the proper repayment of money, borrowed for the need of exploitation, led to the first passing of the Agrarian Law of April 9th, 1870, (Official Gazette No. 55) by virtue of which, according to rules to be fixed by general ordinance, grounds are leased out for a period not exceeding seventy=five years. These rules were fixed by the Agrarian Decree (Royal Decree of July 20th, 1870, No. 15, Official Gazette No. 118) and by the colonial ordinance fixed in accordance with this decree, since altered and amended.

This land lease, as a rule, is allotted by the Director of the Civil Service on behalf of the Government.

The above mentioned Agrarian Decree includes, among other things, the stipulation, that the crown lands, suitable to be let out on long=lease, shall be surveyed, described and mapped by the Government, while every year a part of this property shall be tendered in public in plots of about 500 bahoes (according to a Government decision, not exceeding 550 bahoes for each plot surveyed). This stipulation of the Agrarian Decree, valid only for Java and



RICEFIELDS IN THE PREANGER REGENCIES

Madura, was at first carried out to the letter, but in consequence of the far from satisfactory results of the tenders held, private release upon application, for which provisions were made in the decree, soon became the rule.

For the territory under direct Government control in the Outer Districts, in most of the provinces the issue of long-leases was successively regulated by colonial ordinances, according to the Agrarian Law and the chief principles of the Agrarian Decree. In 1914 however, these regulations were replaced by an ordinance, valid for the State territory in all Outer Districts (ordinance of April 25th, 1914, Official Gazette No. 367), while the rights and obligations of long-lease holders were fixed on the same basis as arranged for Java and Madura by the Ordinance of December 15th, 1913, (Official Gazette No. 699) since altered and amended.

Of course the conditions on the basis of which long-lease rights had been granted previously, or which in consequence of the approval of the long-lease holders, had been made applicable to them, remained in force with regard to these existing rights.

The rights and obligations of the long-lease holder of crown-lands are governed by the 8th section of the 2nd book of the Civil Code of the Dutch East Indies, (with a reservation as to clauses fixed by the above-mentioned ordinance and the mining ordinances), the contents of which are mainly based on this: that the long-lease holder

1st. is allowed to carry out for his own use excavations etc. of stone, clay or other similar species of soil belonging to the land and which are not the object of actual mining, but must allow the exploring or working of minerals only by the authorities, or by virtue of permit or concession of the Government;

2nd. has the free disposal of all trees and plants, whether planted by himself or not, unless it is plainly stated otherwise in the contract;

3rd. is fined in case the rent is not paid to the State treasury within a fortnight after the close of the year in which it was due;

4th. to transfer his right, must have the permission of the Director of Civil Service, except when the lease tax, which is due, and a possible fine have been paid, up to and including the year in which the transfer is made;

5th. to relinquish his long-lease rights, must ask the consent of the Director of the Civil Service;

6th. may lose his right when:

a. the lease tax has not been paid for three years, neither it being paid, after the Director of the Civil Service has given him a term of three months, within which to make payment;

b. his obligation to bring a part of the soil under cultivation within a fixed time has not been fulfilled, according to the opinion of the Director of the Civil Service;

7th. must give notice within a month to the Head of the Province in which the land is situated, in case he transfers his long-lease rights, or assigns mana-

gement of the estate to a proxy, in which failing, he is liable to a penalty, not exceeding glds. 100.—;

8th. must have a special permit for the construction of waterworks on the long-lease land and for the use of water from springs, streams or aqueducts.

Although the principle has always been, that the issue on long-lease, in a general sense, aims at placing otherwise worthless waste lands at the disposal of the big agricultural industry, until a short while ago this was never positively stipulated. At present however, it is generally stipulated at issue, that the lands shall be used for agricultural purposes only.

In this country crown-land on long-lease is only obtainable by:

a. Dutch subjects,

b. residents of Holland,

c. residents of the Dutch East Indies and

d. trading companies established in Holland or in the Dutch East Indies.

For the Outer Districts it is furthermore required that the persons or companies, not established in the Dutch East Indies, must be properly represented here, while in case of death of the holder of a long-lease, if his claimants cannot at once satisfy the requirements, they are allowed a term of one year, beginning with the assignment of the heritage, so as to take the necessary steps of overcoming the legal obstacle against their admission as long-lease holders

In this case other incorporated partnerships are identified with trade partnerships.

In case of the unfrequent public tendering of crown-lands on lease, an announcement is published in the Official Gazette and in numerous newspapers, in which are given complete details regarding regulations governing the tendering, the lowest bid, stipulated conditions etc.

A tendering of this kind is made according to the results of a local investigation, conducted by the authorities.

The handling of private petitions for the granting of crown-land on long-lease is regulated by two „instructions", one for Java and Madura and one for the Outer Districts.

Under the ordinance of July 12th, 1923 (Official Gazette No. 358) and the „instruction" for Java and Madura, the applications for leases in these island, must be addressed to the Director of the Civil Service and presented to the Head of Provincial Government and must be accompanied either bv a letter of survey, made by the cadastre at the expense of the petitioner, or by a clear sketch map, drawn as accurately as possible, stating the location and boundaries of the desired land. No maximum is fixed for the area of land included in one request for long-lease, but not more than 550 bahoes are described in one letter of survey.

After the Head of Provincial Government having received the petition

and registered it with the date of receipt, he places it in the hands of the permanent board, in charge of the local investigation of long-lease applications.

If there are no paramount obstacles against the requested issue, (for instance in connection with the use already made of the land or with some purpose already assigned to it), the request for long-lease is published in the native villages, to which the desired land belongs and in the neighbouring villages, with the information, that during a month's time, the population may lodge their objections to the application.

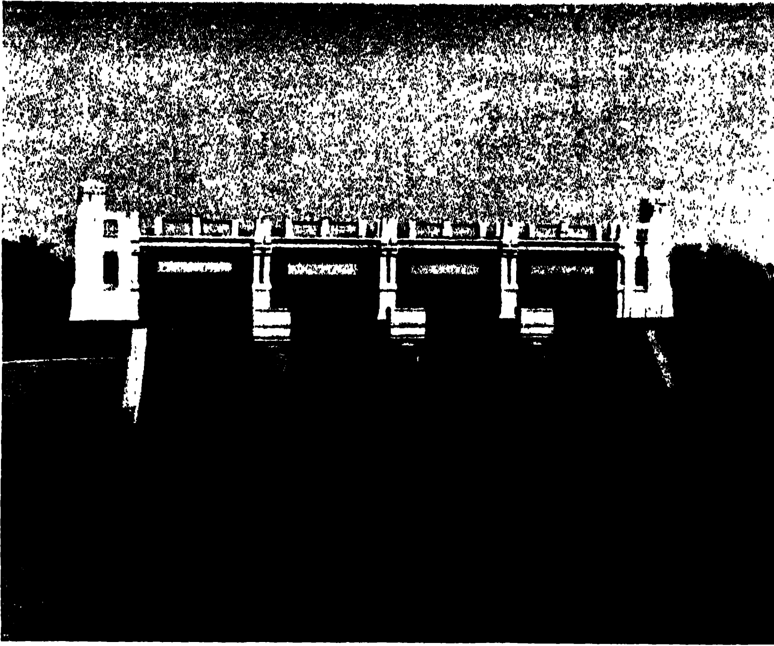
In the meantime the commission makes a local inquiry, whereby the petitioner is obliged to assist, by indicating personally the boundaries of the desired lands or to have this done by a proxy.

The experiences of the committee are set down in an official report, in which is also included any objection, which may have been made by the population and in which it gives its views concerning the requested land issue, the special terms to be recommended and the annual amount of taxes, which it thinks should be demanded, the fixing of which is determined according to the quality and location of the lands.

The Head of the Provincial Government Service sends the official report, accompanied by his propositions and, if necessary, with the advice, which he has obtained from the other division-heads concerned (irrigation areas) and from the forester (timber indemnification) to the Director of the Civil Service. After the request has been submitted also to the judgment of other Chiefs of Department, as far as necessary, the result is published by decree.

The promise of the long-lease resulting from an application whereby, as is the rule, only a sketch map of the land, which is to be yielded, is produced, only bears a temporary character. It includes the consent of the Government to grant the long-lease right of the lands under consideration for issue on the basis of the existing regulations ,,such as these might be altered and amended in the meantime" and under the particular conditions indicated in the decree, provided that the petitioner within a certain length of time (usually fixed at six months or more if necessary), produces a letter of survey with a request for a permanent assignment. After the above-said temporary pledge and after any stipulated indemnification has been paid to the population, according to the communication of the applicant, after the advance demanded for the settling of the costs of survey has been received by the survey office concerned, after the required permanent boundary posts have been placed and the clearing of boundary lines, necessary for surveying, is ready, the members of the committee, in the presence of the surveyor, go to the land applied for, so as to assure themselves that no other lands are marked off and indicated than those, which the Government is willing to give in long-lease and at the same time to give in an official report their suggestions, in connection with any further provisions, which may be necessary for the definite granting.

In case of the application being accompanied by a letter of survey, describing the land applied for, the drawing of the above mentioned sketch map



FLOOD PROTECTIVE SLUICES AT BATAVIA

may of course be dispensed with, while the Government, instead of giving a temporary consent, makes a standing promise at once. The petitioner sends the letter of survey to the Head of the Provincial Government with the above-said request for a fixed promise of the long-lease rights and the latter forwards the documents to the Director of the Civil Service, after adding the necessary papers (the forester's advice, the official report of the second investigation, etc., and his own proposition). The definite consent for the long-lease rights contains a complete statement of the regulations, which apply to the right to be granted, besides the concerning regulations in the Civil Code for the Dutch East Indies, the conditions, under which the Government is disposed to grant the land on long-lease, among which conditions is the express stipulation, that the acceptance of the promised long-lease rights shall take place within six months after the date of the decree, except when it is found necessary to extend this term.

Neither the temporary, nor the permanent pledge gives the holder the right to take the land into use.

This right is only obtained after the long-lease right has been entered in the public registers, set apart for that purpose (establishment of the long-lease right). The essential part of the Decree, referring to the request, is usually entered in full in the legal deed, whereby the long-lease right is established in the name of the person who obtains it.

If it is of importance to the petitioner to begin at once with the cultivation

of the land, he may obtain permission from the Director of the Civil Service on application.

Applications for land on long-lease in the Outer Districts are handled practically in the same way as described above for Java and Madura.

The most important deviations, except those, resulting from a somewhat different Government organisation, are the following:

1st. Each application may not refer to a greater area than 5.000 bahoes;

2nd. As a rule, the granting of the long-lease right is based on a sketch map, which complies with certain requirements. When the lands are situated in a province, for which maps in detail can be obtained from the Topographical Service, the boundaries of the lease must be clearly defined, either on those maps or on exact copies of them. If there are no maps of the country, or only unreliable ones, special attention must be paid to the description of the angles of the plot. In both cases a complete description of the boundaries of the plot is necessary. A letter of survey may be demanded only for the provinces or parts of provinces, indicated by the Director of the Civil Service, and moreover when, in his opinion, the small acreage of the lease makes it necessary;

3rd. In provinces or parts of these, indicated by the Director of the Civil Service, the Head of the local government may deal with applications on his own accord and return them to the applicant accompanied by his decision in writing, if the latter fails, after having been advised by registered letter, to show to the satisfaction of the said official within limited time, which may be extended if necessary, that he possesses the means or can obtain them, needed to bring the land applied for, in exploitation within reasonable time;

4th. If the application is further dealt with, the applicant will be invited by the Head of the local government by registered letter, to deposit within a limited period to be fixed and, if necessary, extended by this official, into the Government Treasury, an amount of gld. 0.50 (fifty cents) for each bahoe of land to be examined, calculated on the basis of the estimated acreage of the land applied for, as a recompense for the expenses connected with the examination. For plots of land smaller than 100 bahoes, exemption of this payment may be granted;

5th. On production of the deposit receipt, the Head of the local government fixes a term for the applicant, within which he must enable the commission to make a local survey of the land, by clearing footpaths and such alike, and must stake the boundary posts, for so far the boundaries are not formed by natural divisions, by plainly visible marks of some durability.

The said period is extended only *once*, if the same land has in the meanwhile been entirely or partly applied for in long-lease by another party;

6th. The long-lease right is granted without previous temporary promise by virtue of a decree, whereby the term for the acceptance of that right is usually fixed at one year after date of the said decree;

7th. In general, a maximum of gld. 1.— per bahoe is charged, in fixing the annual ground rent, which is a fixed amount, if the lease is granted on the

strength of the sketch map and which a later survey can only change by approval of the Government.

In exceptional cases, especially for lots of limited area, the ground rent may be fixed at a higher amount.

In Java and Madura as well as in the Outer Districts, there is a legal exemption from the payment of ground rent and land tax (verponding) during respectively the first five and ten years, but the Director of the Civil Service is authorized to deviate from this rule, in case the lands applied for, consist of lots formerly under long-lease or if they are wholly or partly under cultivation.

II. In self-governing communities in the districts outside Java and Madura.

The interference of the Dutch East Indian Government in agrarian affairs in the self-governing communities, is based on what is expressly stipulated in the political treaties concerning this subject, or arises from the tendency of these treaties, and among other things has led to the issue of so-called agricultural concessions in the interest of the agricultural industry.

In some communities this issue is made by the self-government, subject to the approval of the Head of the Provincial Government, in other communities by the Head of the Provincial Government, on behalf of the Government. The last mentioned concessions must be definitely accepted within the term fixed for that purpose.

With the exception of the Residency of the East Coast of Sumatra, the same rules apply to the admission as holder of an agricultural concession as mentioned above for long-lease holders of crown-land in the Outer Districts, with this understanding, that concession holders must choose their domicile at the office of the Head of the Provincial (or local) Government concerned.

The concessions include an agreement for the running of an agricultural enterprise on those parts of the concession, suitable for this purpose.

Often such a concession partly consists of lands, belonging to the population, which, if desired, must remain at the disposal of the owners, the extension of which, in some cases, must be tolerated by the concession holder.

Land required for Government services must also be put at the disposal, free of charge. With regard to the tolerance of mining researches and mining, either by the Government or third parties, the using of ground species for own benefit and the disposing of the timber on the concession for the needs of the agricultural enterprise, almost similar regulations are in force as for those, holding crown-land on long-lease.

Of course the regulations, included in the concession deed, are in force for both parties. If in consequence of this deed, differences should arise, the Head of the Provincial Government decides, if the interests of the population are at stake; otherwise the decision of a court of arbitrators may be called in.

With regard to the annual rent, a minimum of gld. 1.— per H.A. is usually

charged, with this understanding, that for the charging of a lower rent the authorization of the Government is required.

The grounds may not cover a larger area than 5.000 bahoes, except bv approval of the Government, and are granted for not longer than 75 years.

In the first years of the concession a partial exemption from rent payment is allowed in this way, that on the first year 1/5 of the fixed annual rent is demanded, on the second year 2/5 and so on, so that the full rent is paid for the first time on the fifth year. In case of the holder of the concession failing to meet his obligations he may be legally summoned for payment, while, if he does not even then pay the rent, the concession is legally forfeited three months after the summons referred to.

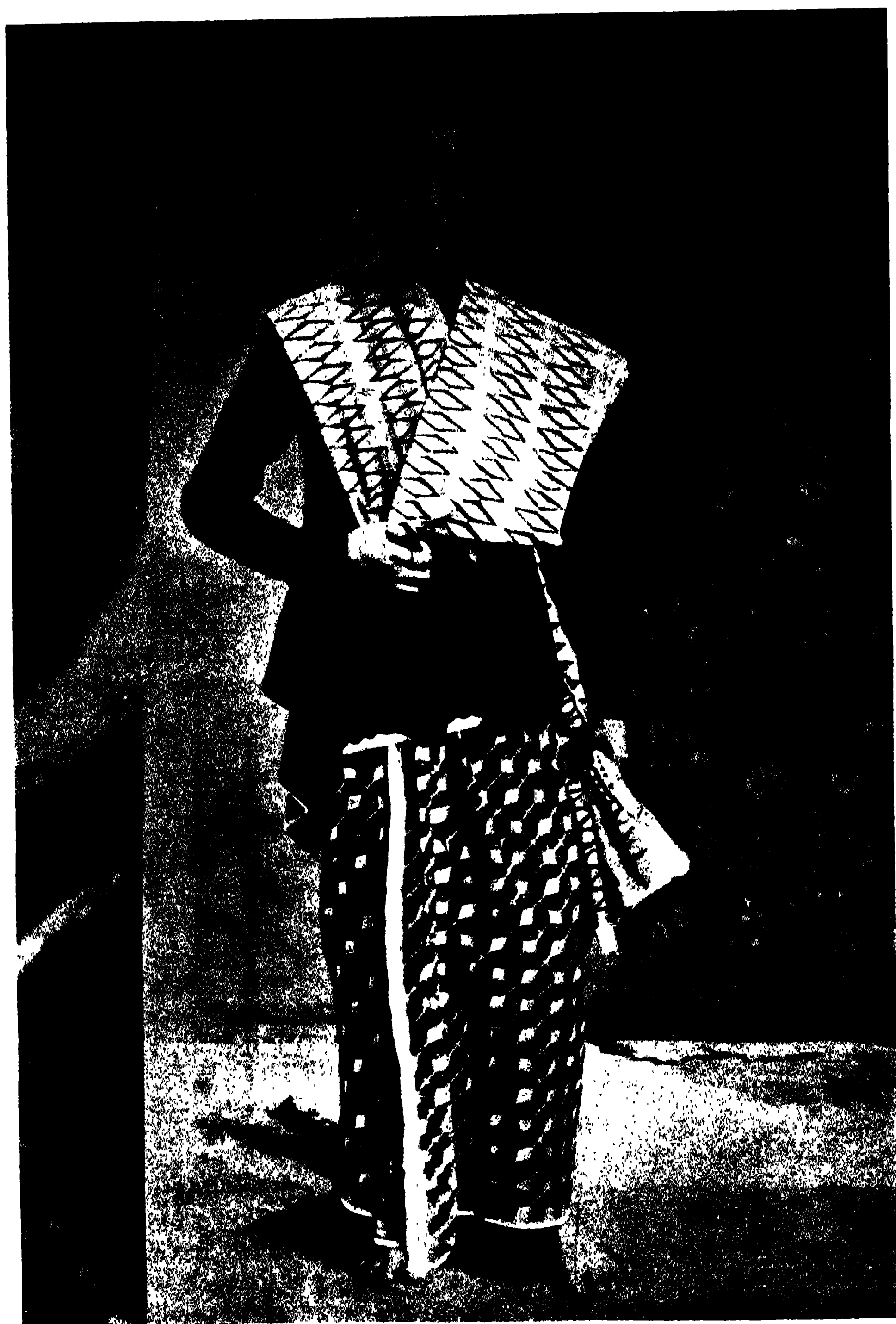
The institution of agricultural concessions is not free from grave defects, which cannot entirely be abolished. In the interest of the agricultural industry therefore, the possibility is opened, to obtain the long=lease right in the self=governing communities.

In the Official Gazette 1919, No. 61, the long=lease ordinance of February 6th, 1919, for the self=governing communities outside Java and Madura, was published, on the basis of which lands may be granted on long=lease by the self=governing communities with the consent of the Head of the Provincial Government, for the benefit of persons, to whom the regulations of the Civil Code of the Dutch East Indies, concerning essential rights, may be applied.

The regulations of this ordinance, in the main, correspond with similar regulations concerning the long=lease issue in the directly ruled territory in the Outer Districts.

The long=lease application, which mav not refer to a greater area than 3.500 H.A., is presented through the Head of the Provincial Government to the self=government. The commission of investigation is appointed by said Government official, after consulting the self=government; it submits an official report to the self=government and to the Head of the Provincial Government. The costs of the investigation may be entirely or partly charged to the applicant, this to be decided by the Head of the Provincial Government. As manager and over=seer and assistant, only such persons may be employed on the long=lease lands, as have obtained a written permit, given for this purpose by the Head of the Provincial Government and valid until further notice. They, as well as the holder of the long=lease and his representative, are obliged to give information regarding the estate for the benefit of the Government.

The annual rent, due to the community concerned, amounts to at least gld. 1.— per H.A., which amount may be reduced in special cases or for special regions, to be decided by the Director of the Civil Service, while partial exemption during the first years, is given in the same wav as indicated above for the rent of agricultural concessions.



JAVANESE LADY

The long-lease ordinance mentioned before, applies to all self-governing provinces of the Outer Districts except the following:

Asahan Deli Kualu and Leidong Langkat Pelalaroan Serdang Siak Srie Indrapura	East Coast of Sumatra.
Mempawa Pontianak Sambas Tajan	Western Division of Borneo.
Kutei	S. and E. Division of Borneo.
Bima Dompo Sanggar Sumbawa	Timor and Dependencies.

IMMIGRATION.

The immigration regulations comprise, besides the stipulations whereupon landing is permitted, the conditions for admittance and settlement in the Dutch East Indies.

For the application of the regulations, travellers to the D. E. I. are divided into two groups, viz. those, who wish to settle, and those, who do not end their voyage here.

So as to meet as much as possible, passengers, who wish to stop only temporary in this country, either tourists or on business, these are generally classified amongst the second-mentioned group, for which a liberal regulation has been called into existence.

The *disembarkment* may only take place in specially allotted harbours viz: in Java at Tandjong Priok (Batavia), Sourabaya and Samarang, besides 24 harbours in the Outer Districts, namely: Sabang (island Pulu Weh), Langsa, Pangkalan Brandan, Tandjong Pura, Belawan Deli (Medan), Tandjong Balei, Sungei Guntung, Djambi, Palembang and Emmaharbour (Padang) all in Sumatra; Bengkalis (isl. Bengkalis), Selat Pandjang (isl. Tebingtinggi), Pulu Sambu and Tandjong Pinang (Riouw Arch.), Muntok and Pangkal Pinang (Banka), Tandjong Pandan (Billiton), Pontianak, Singkawang, Bandjermasin, Balik Papan and Tarakan (Borneo) and Macassar and Menado in Celebes.

Untill ult. December 1922, there was also an opportunity at Singapore to provide oneself with the necessary immigration certificates at the office of an official of the D. E. I. immigration service. This office however has been discontinued since January 1st. 1923.

Before landing, the immigrants must provide themselves with a *permit for disembarkment,* which is issued against payment of stampduty, which amounts to 50 guilders.

Hollanders are exempted from payment of this duty. The disembarkment fee is refunded to passengers who leave the D. E. Indies within 6 months after arrival, and besides to those, whose admittance to the D. E. I. is refused.

Refunds are further effected, when permits to disembark have been issued to persons who, on the strength of any regulation of the disembarkment formalities, ought to have been exempted, but on their arrival could not prove it, for want of the necessary documentary evidences.

The *permit for disembarkment* also applies to the wife and infants of the immigrant.

These permits, issued to 1st. and 2nd. class passengers on board the steamers of the principal Steamship Companies, mentioned expressly in the Ordinance of Admission, are also intended as admission permit, unless, according to the opinion of the disembarkment officer, there are objections against the admittance itself.

Those, who have only obtained a disembarkment permit are obliged to present this permit immediately after landing to the Secretary of the local Immigration Committee, in exchange for an admission permit. In special circumstances the disembarkment officer can make other arrangements with regard to this exchange, f.i., allow the exchange for an admission permit, in another harbour than that one of arrival.

A permit for disembarkment is i.a. not given to persons, who prove to be insane, idiot or suffering of a contagious disease or, owing to their physical condition, will probably come upon the parish.

The admission permit is refused, besides for the above mentioned reasons, to immigrants of whom it is evident:

a. that they practise prostitution as their occupation;

b. that they have been sentenced in a foreign country, with which an extradition treaty has been concluded, on account of a crime, for which, by virtue of this treaty, extradition should occur;

c. that the residence in the D. E. Indies has been forbidden to them; furthermore to those:

d. who cannot prove that they are able to support themselves as well as their family;

e. who are considered to be a danger to public peace and order;

f. who, being a foreigner, either possess a pass that is superannuated, for which a Dutch visa was obtained before starting on a journey to the D. E. Indies, neither is in possession of another letter of conduct, — considered

sufficient proof by a Dutch diplomatic or consular representative.

For Oriental Foreigners born in China, the Straits Settlements and the Federated Malay States, who are artisans, the possession of a regular passport or a letter of conduct is not wanted.

The admission permit entitles the legal holder to remain during two years in the D. E. Indies, observing the regulations on traffic and residence.

The term of two years may be extended twice for one year at the outside, by the Chief of the local Government of the living=or abiding place of holder, so that the validity of the admission permit with the renewals, is at the utmost four years.

Persons, who wish to settle in the D. E. I. have to provide themselves with a *permit of settlement*, before the expiration of the validity duration of their admis=sion permit, through the good offices of the Head of the Provincial Government, from the Governor=General in case of their abode being in Java or Madura.

In the Outer Districts this permit is granted by the Chiefs of the Provincial Government, through the good offices of the Chief of the local Government of the living= or abiding place.

The request must be presented by letter and drawn up on a stamped paper of gld. 1.50 At the same time, the valid admission permit, two photos and a stamped paper in blank of glds. 5 must be added. This last one in settlement of the duty to which the permit of settlement is subject.

The residentship is lost, in case of being out of the D. E. Indies for a longer period than eighteen months.

The regulations mentioned above, concerning the immigration are not applicable to:

a. Persons sent by the Home Government to the D. E. Indies, with their family;

b. Consular officers with their family;

c. Officers and the crew of ships belonging to the navy of any foreign power;

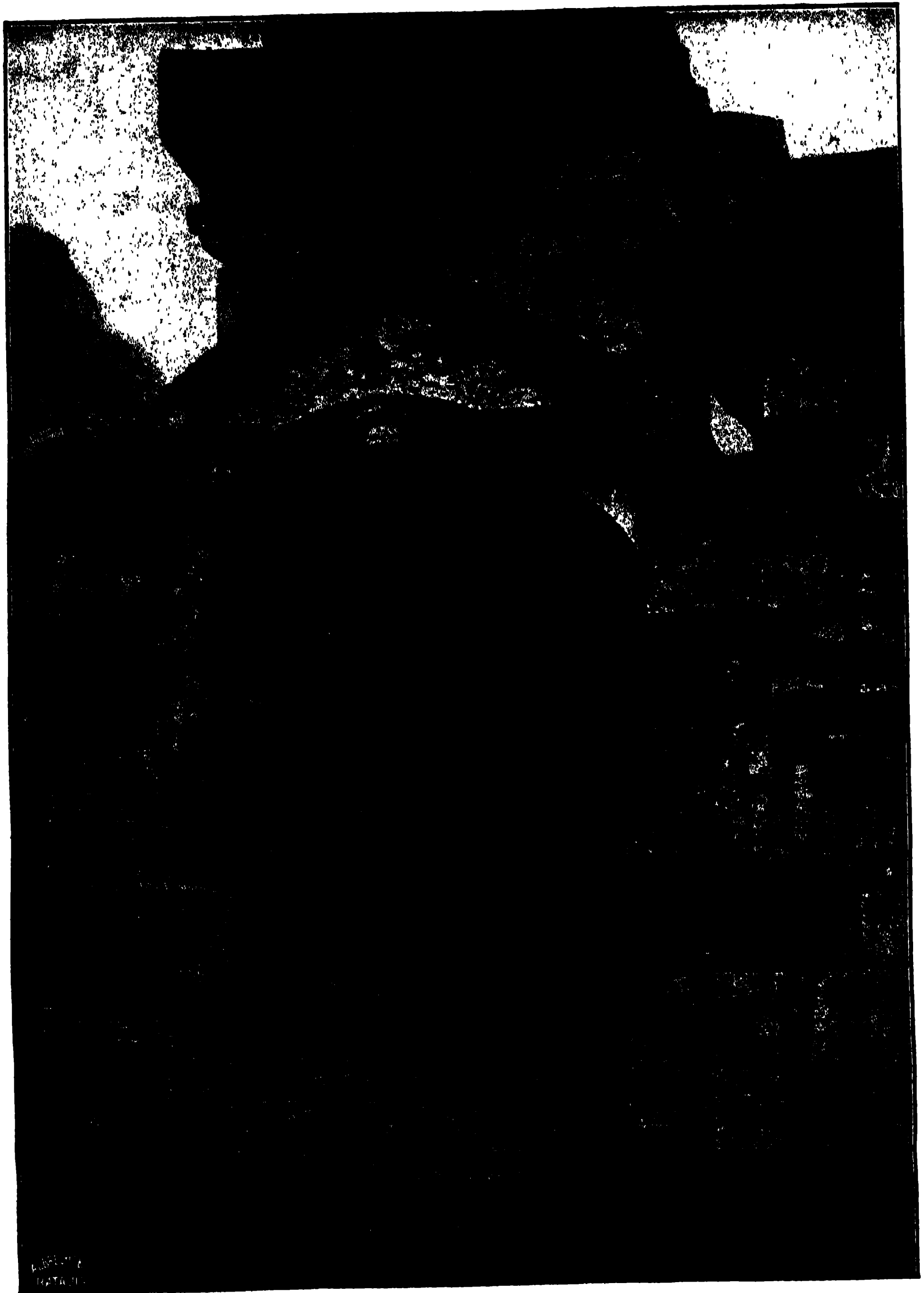
d. Captains, officers and sailors of trading vessels, unless their commission ends at the arrival or during the stay of the ship in any harbour;

e. those, who do not end their journey in the D. E. Indies.

The regulations of the immigration legislation, at last cannot be enforced on artisans, put on a par with natives, who have been recruited in foreign parts to work in this country, or on the footing of a stipulated labour=contract by coolie labour ordinance (s.c. contract coolies).

If the contract is not established, its registration refused, or the conclu=ded contract no longer observed, the immigration regulations must be applied to the artistan and a sum of 50 glds. is due for the necessary admission permit.

The artisans mentioned above, may be considered liable to an admission permit, for which they have only to pay gld. 1.50 stamp=duty, if they have observed their contract for three years and after the termination of their labour contract.



BOROBUDUR. STATUE OF DHYANI-BUDDHA. (AMOGHASIDDA)

LABOUR INSPECTION AND THE RECRUITING OF COOLIES.

Outside the thickly populated island of Java, where the supply of labour as a rule exceeds the demand, local labour is not available in sufficient quantity, nor is in most cases the native population on these other islands (collectively called the Outer Districts) willing or fit to work regularly on estates or in factories. Therefore the employers have to obtain labourers — male as well as female — from Java or altogether from outside the Dutch East Indies, mainly from China.

In Java native labour falls under the common law and compulsion to serve the terms of contract is non=existent.

In view of the scarcity of labour on the islands outside Java, mentioned above, special legislation has been enacted since 1880 for the recruitment of Javanese coolies and the protection of the employer against unwillingness and desertion of the Javanese and Chinese coolies, once they have entered into a contract with the employer or his recruiting agent. On the other side the treatment, housing and medical attendance of the coolies are under strict supervision of the Government Labour Inspection.

For all the different provinces of the Outer Districts special coolie= ordinances are enacted, except for Bali, Lombok and Timor, where the importation of contract=labour is not allowed.

The main features of this legislation are as follows:

The contracts, signed in Java by the would=be coolie, called immigra= tioncontract, are examined by a Government officer and must contain special clauses as to wages, repayment of advances, hours of work, days off, nature of the work and name of the estate.

Their maximum=duration is three years. Such contracts are allowed for estate=work, commercial and industrial service, mining, construction of roads and railways, service on railways and for public works.

After this examination the employer or his agent is allowed to ship the coolies to the estate. After the term of three years the employer has the obli= gation to re=ship the coolies, if they want to return to their home in Java, but mostly a new contract is made on slightly higher wages, called re=engage= ment=contract, which can be renewed, if the coolie is willing, year after year.

On the same footing coolies may be engaged from outside Java, as well from the other islands of the Archipelago as from foreign countries, China, Straits=Settlements, British India etc. Coolies, imported under contract from outside the D. E. Indies, are free from immigration=fees.

The compulsory clauses in the coolie=legislation serve to compel both parties to execute the agreement in a proper way. They entitle the employer to have the coolie, who leaves the estate without acknowledged reason within the term of his contract, brought back by force and to have him punished by the authorities in case of unwillingness. Corporal punishment however is strictly forbidden.

The total number of coolies, working under this regulation, amounted in 1922 to about 281.000 of whom 180.000 (143.000 males and 37.000 females) in the Province of Sumatra's East Coast (with Medan as capital) only.

It is also allowed to engage coolies, both Javanese, Chinese and others, on a free-labour-contract under the Free Labour Ordinance of 1911. In such case there is no penal-sanction and no exemption from immigration-fees. There is the same supervision as to housing, treatment, etc. and the contracts are also examined.

The Recruiting-Ordinance, regulates the obligation of the recruiting-agents as to inland depots and those at the ports of embarcation, the medical examination of the coolies and the inspection of the contracts.

In addition to the Recruiting-Ordinance, in 1915 regulations were passed for the recruitment of coolies not by means of recruiting agents, but by the estate-owners themselves. The Combined Rubber-Growers (Avros) and the Combined-Deli-Tobacco-Growers (D. P. V.) created an organization to that end, called the Adek (Algemeen Delisch Emigratie Kantoor) with establishments at Bandung, Sourabaya and Batavia. Another concern, the "Zuid-Sumatra Landbouw- en Nijverheids-Vereeniging", also has its own organization for the recruitment of their labourers in Java.

The Combined Tobacco Growers besides have an office in Samarang for the recruiting of free Java-coolies by old hands. These old hands are sent for that purpose from Sumatra to Java, whence they return to Sumatra with the new hands and their families.

The Chinese are recruited on more or less the same lines, mostly in Hongkong, where the Tobacco-Growers-Association has its own organization. This recruiting is done partly by „laukeh" (old hands), returning to China for their holidays, partly by „kehtau", people specially occupied in hunting up emigrants. The Association has also a recruiting-office in Hongkong for the same purpose.

The number of coolies who emigrated under contract from Java to the Outer Districts amounted to:

1920:	55.710
1921:	36.326
1922:	13.022

Recruiting of natives of the Dutch East Indies for labour outside the Archipelago is prohibited since 1887, an exception being made for domestic servants and for native musicians and dancers, who are engaged to give performances abroad.

The Governor-General is entitled to dispense with this prohibition in special cases; these dispensations however are granted exclusively for those adjacent colonies on whose behalf formerly permits had been given viz: Straits Settlements, the Federated Malay States, British North Borneo, Sarawak, some districts of French Indo China and New Caledonia.

The immigrants to foreign colonies amounted to:

COLONY	1920	1921	1922
New Caledonia	—	—	600
British North Borneo	989	552	30
Sarawak	174	40	—
Federated Malay States and Straits Settlements	1.536	70	100
Cochin China	—	—	100
Total	2.699	662	830

AGRICULTURE.

The Dutch East Indies, favoured as they are by the soil and the climate, are one of the most important territories for the tropical agriculture. In none of the other tropical countries, is such a large variety of produce grown and the cultivation of these brought to such a high pitch of perfection.

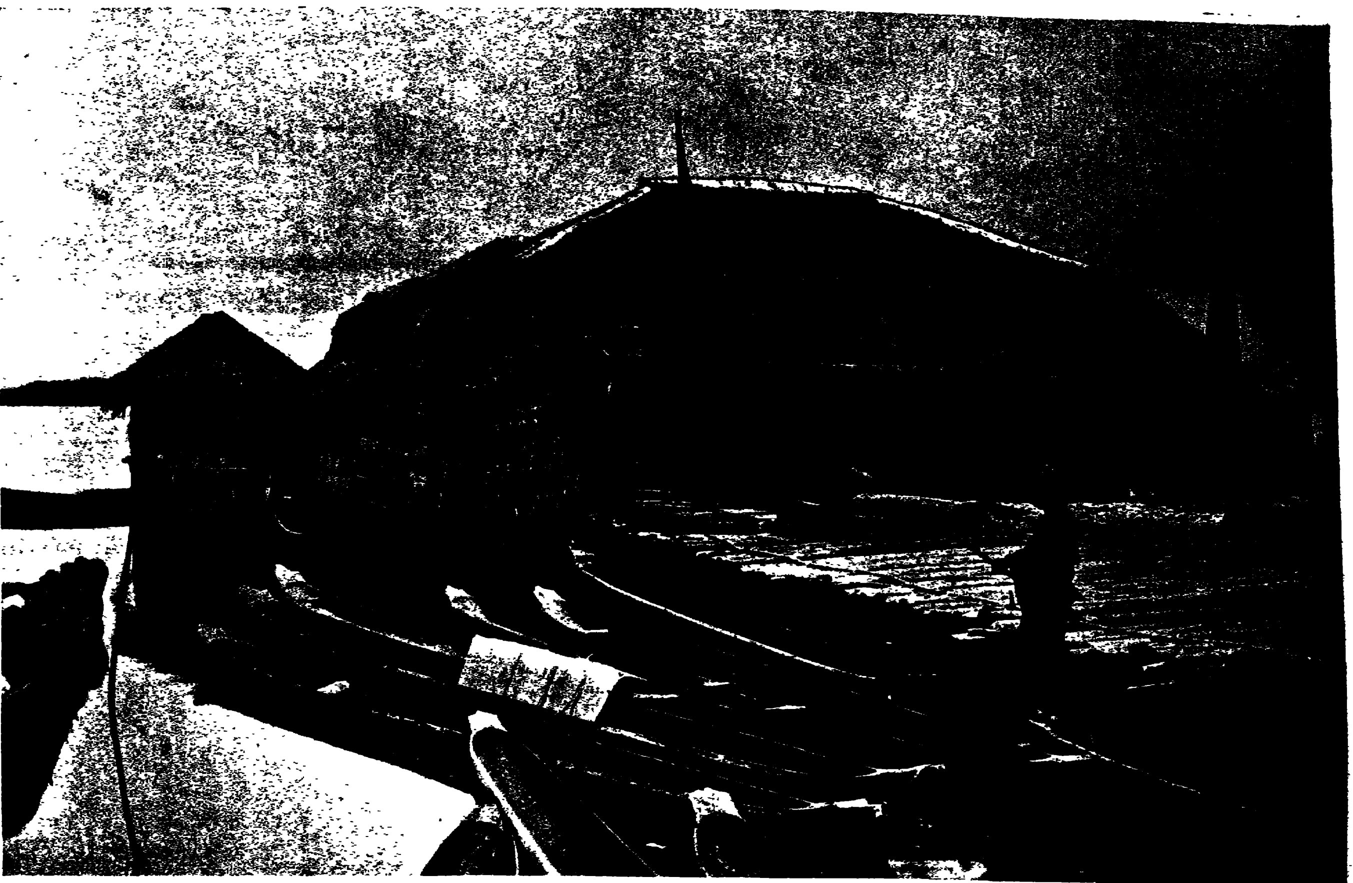
Under these circumstances it can easily be understood, that agriculture in general is the main factor in the economic development of this colony.

There is a distinction of two classes in the D. E. I. agriculture, namely the so called large agriculture and the native agriculture.

The large European cultures all bear the characteristics of a capitalistic agricultural industry, which only specializes in a few produces and works for the export market. The native agriculture on the other hand has in view in the first place, and especially in Java, to provide for the first necessities of the population, while the production for the world markets is only a secondary question.

Between these two extremes are of course many varieties. It would be wrong to think, that the native farmer will only spare his more or less accidental surplus for export purposes. There are in the D. E. I. districts, especially in the Outer Districts, where the native population specializes, in the first place, in the production of export articles. Such is the entire production of pepper, fairly one third of the rubber production, nearly the whole production of kapok, one quarter of the export of coffee, which are all produced by native growers.

The main crops grown on the large estates are: sugarcane, rubber, coffee, tea, tobacco, cinchona, coconuts, agava, cocoa, palmoil, fibres, lemongrass, coca, etc., while the main products grown by the natives are: rice, maize, cassava, sweet potatoes, soya beans, peanuts, sugarcane, cassia, tobacco, coconuts, rubber, coffee, tea, kapok, cotton, pinang nuts, etc.



FISHING VILLAGE IN THE OUTER DISTRICTS

Government support of Agriculture.

Considering the great importance, which agriculture has for the economic life of the Netherlands East Indies, the Government is giving every possible support towards it. The Government supervision is carried out by three General Service Departments, that is to say by the Civil Service Department, for so far as the Agrarian Law, the real estate and the leasehold regulations, the issue of agricultural concessions, the leasing and sale of land, are concerned; the Public Work Department, for so far as the irrigation works, water supplies and water conservancy matters in general are concerned; the Department of Agriculture, Industry and Commerce, for so far as it concerns the agricultural advice, tests and researches, the direct promotion of agri=culture and cattle=breeding. The matters, which fall under the care of the first two mentioned Departments are dealt with in separate chapters.

The care which the Department of Agriculture, Industry and Commerce bestows on agriculture will be dealt with below.

This Department has a staff of scientific and expert personnel and various installations and laboratories for making agricultural tests and researches. Furthermore there are various agricultural colleges, while agricultural experts, who each have a certain district allotted to them, give practical advice.

All institutions of the Department of Agriculture, Industry and Commerce, which carry out purely scientific researches, range under the Government Botanical Gardens at Buitenzorg.

These include a herbarium and museum for systematical botany for the studying the Netherlands Indian flora, botanical laboratories for the general biological, physiological and anatomical examination of plants. In the Treub=laboratory is a large, completely equipped, laboratory especially intended for each naturalist, who visits Buitenzorg for the purpose of studying the Dutch East Indian flora or a certain section of it. Other laboratories are the zoölogical laboratory with museum and a systematic collection, the phytochemical laboratory and the laboratorv for deep sea exploration in Batavia.

Besides these institutions for more abstract scientific researches, there are a number of institutes for applied sciences, which work directly on behalf of the native, as well as the European agriculture.

Such is for instance the General Experimental Station for Agriculture, which aims at supplying scientific advice about all questions, which may crop up regarding the soil, water, the climate and the planting material with reference to agriculture.

To this General Experimental Station belong:

a. The laboratory for agrogeology and soil research;
b. the laboratory for microbiological researches of the soil;
c. a chemical laboratory with experimental gardens;
d. a botanical laboratory;

e. the sub section for the raising and the improvement of seeds of perennial plants, with the nursery gardens at Buitenzorg, the coffeeseed gardens in Bangelan (Malang), the station for the improvement of perennial crops and the testing and seed gardens for perennial crops in the Lampong Districts in South Sumatra;

f. the subsection for the improvement and seedgrowing of annual crops with the nursery gardens and the bureau for agricultural tools at Buitenzorg, the special task of which is to improve the agricultural tools in use, especially those of the native farmers: the Muara Seed Gardens at Buitenzorg, the seed gardens for rice and secondary crops at Buitenzorg, Ngandjuk and Sidoardjo.

Another institute, which is based on the same lines, is the Institute for Plant Diseases, which takes care of the various diseases and pests, the means to fight these and the planning and application of the measures to prevent these. This Institute also has charge of the combating of vermin.

The Agricultural Section of the Department of Agriculture, Industry and Commerce has special charge of the planning and the application of measures, which will ensure lasting and more satisfactory results to the native agriculture.

The agricultural and horticultural extension service belong to this section. It has at its disposal a number of European experts, agricultural and horticultural advisors, also native agricultural teachers and overseers, who have been trained in European methods. Details on this service are given in a separate chapter.

The Section „Agricultural Economy" of the Department of Agriculture, Industry and Commerce looks after the promotion and the support of the large agriculture. The task of this section, which was established in 1918, is a double one, viz. on the one side the examination of the factors, which govern the vitality of the existing agricultural industries and on the other side the reconnoitring of undeveloped territories as to their suitability for agricultural purposes, with the intention to furnish such information to the private agricultural industry. Furthermore scientific researches regarding certain cultures may be carried out under the supervision of the Department for private account.

Several private experimental stations work in close connection with the Department. One of these stations, the one for the tea culture, is even attached to the Department as a private section.

Finallv the Government itself acts as a large estate owner. She was the first one to take up the cultivation of cinchona on a large scale in the Preanger Highlands, for which the seeds were imported in 1854.

Out of these experimental and propaganda gardens grew the Government Estate Tjinjiruan with the attached Government cinchona experimental station. Seeds, seedlings, etc., grown on the estate, are sold in public at regular periods, and in special cases also privately.

In this way superior planting material is placed at the disposal of new estates.

In the same way the Government rubber and guttapercha estates came into existence from the trial plantations, laid out by the Forestry Department since 1900.

The Government Rubber and Guttapercha Industry is dealt with in a separate chapter.

The European cultures.

The large agricultural industry in the D. E. I. has gradually developed into a, in all details, well thought out economic organization, which has reached a high grade of perfection.

The backbone of this organization, as far as the sugar industry is concerned, is formed by a number of big companies, which control groups of estates, either in own management or as agents for other owners.

These large central institutes have the full management of the estates.

They are responsible for the financial management, the organization of the technical and administrative management of the estates, the appointment of the personnel and the disposition of the production.

In order to be able to look after the mutual interests of similar estates in the most satisfactory way, these various companies joined into a large organization, the „General Syndicate of Sugarmill owners in the Netherlands East Indies", which represents this chief group of estates.

The other agricultural estates in Java have local associations, in general for one or a few products. These associations are amalgamated into the „General Netherlands East Indian Agricultural Syndicate".

Closely connected with the Sugar Syndicate and the Planters Associations, a number of scientific institutions the so-called Experimental Stations have been established, which are in charge of the practical researches on agricultural and technical subjects, and the manufacture of the raw product into the shape, in which it is sold, so as to be in a position to introduce the latest improvements in the working of the estates and to force up the output as high as possible.

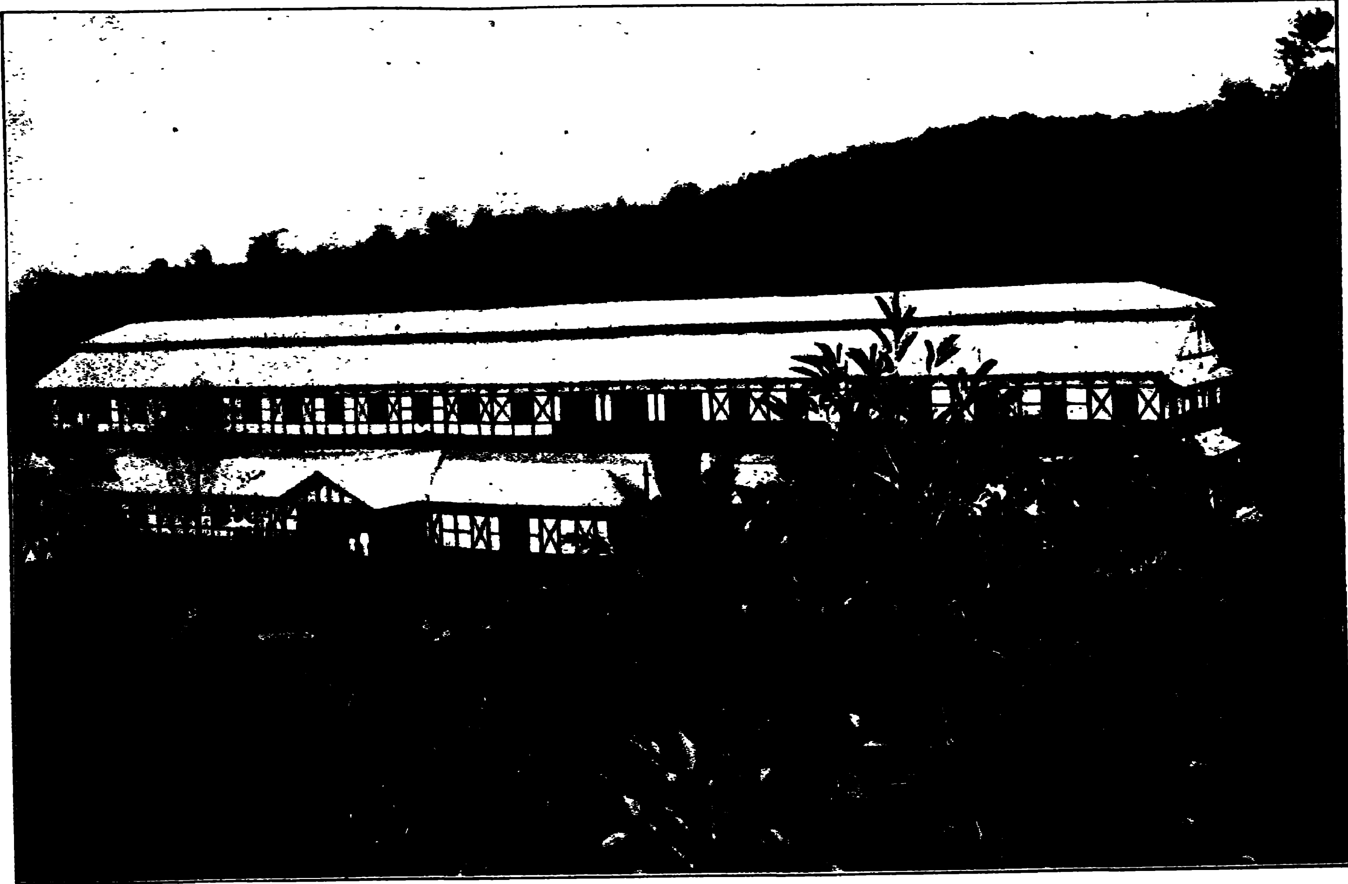
These experimental stations have a staff of scientific experts, who have all means at their disposal to execute their work as efficiently as possible.

Especially the experimental stations for the sugar industry are particularly well equipped, thanks to the powerful organization.

The central organization is called „Associated Experimental Station for the Java Sugar Industry" established at Sourabaya. This Association has the same Board of Directors as the General Sugar Syndicate.

The work of the Sugar Station is divided into three main sections viz. the agricultural, the chemical and the technical section.

The benefits of the work of these sugar experimental stations, which were established in the darkest years, the sugar industry had to face, are clearly



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demonstrated by the great strides, which the sugar industry in Java has taken since.

The experimental stations for the other products in Java are for the rubber industry: the Central Rubber Experimental Station and the Rubber Experimental Station West-Java, both at Buitenzorg and for the tea industry: the General Experimental Station for Tea also at Buitenzorg.

Furthermore there are for the so-called hill cultures, the cocoa, coffee and rubber culture: the Central Java Experimental Station at Salatiga, for the benefit of the estates in Mid Java; the Malang Experimental Station at Malang and the Besuki Experimental Station at Djember, for the benefit of the coffee and rubber culture in East Java, the latter one also for the tobacco industry; the Vorstenlanden Experimental Station at Klaten (Central Java) for the benefit of the tobacco.

In Sumatra, at Medan: the Deli Experimental Station, which is a general central experimental station for the estate district on Sumatra's East Coast. Its main purpose is the study of the tobacco culture.

For the rubber and palm oil culture and all other cultures, with the exception of the tobacco culture, the „Avros" has a General Experimental Station at Medan.

The managers of the various estates form, amongst themselves, planters associations for the purpose of promoting the purely technical estate interests as much as possible.

As regards the separate cultures the following general details may serve to get an impression of their size and importance.

Sugar.

The sugar industry undoubtedly occupies first place among the European large cultures. So far it has only been developed in Java. The sugar is obtained from sugarcane, of which in 1922/1923 an area of 161.793 H.A. was planted. In 1894 the planted area was only 75.048 H.A., which during the following two periods of ten years, respectively increased to 103.690 H.A. in 1904 and 147.538 H. A. in 1914.

The average sugar production per gross H. A. amounted to 7.070 K.G. in 1894, 10.191 K. G. in 1914 and 11.183 K. G. in 1922.

The production in cane per unit surface has been practically stable during the last 10 years and fluctuates round about the 100.000 K. G. per H. A.

The yield of cane in sugar has also, during late years, been showing a fixed average of 10.5% of its weight.

The cane crop, in 1922 amounting to 17.132.000 metric tons, was crushed in 182 mills, which produced a total quantity of sugar of 1.809.391 metric tons, giving a yield of 10.57%.

The sugar cane is for the greater part planted on irrigated land, which must be leased from the population.

So as to prevent that too much land is leased from the natives, strict

legal regulations, which are embodied in the so called leasehold ordinance, have been issued for the entering into lease contracts for the cultivation of sugar cane.

Each mill gets a fixed area allotted in a certain district.

For the extension of the land as well as for the erection of new mills the permission of the Government is required.

The same piece of land, as a rule, may only be planted once in three years with sugar cane.

Rubber.

The rubber industry in the East Indies is of comparatively recent date and none of the other cultures can boast of such a tremendous growth.

The plantations chiefly consist of Hevea Brasiliensis, which was introduced in Java for the first time in 1876.

The number of estates planted with rubber amounts to 796, of which there are 438 in Java and 358 in the Outer Districts.

At the end of 1922 105.296 H. A. in Java and 198.703 H. A. in the Outer Districts were planted with rubber only, there being no intermediate crops.

58.719 H. A. in Java and 10.877 H.A. in the Outer Districts were planted with rubber and intermediate crops.

The number of rubber trees belonging to natives, was estimated at about 80 millions at the end of 1922. About 1/3 of the rubber exports from the Dutch East Indies in 1923 was native rubber.

During late times shipments have been made of preserved latex in a fluid state.

The other kinds of rubber producing trees, which were planted originally, such as Ficus Elastica and Castilloa only cover negligent areas now, which are becoming smaller each year and will soon be rooted out altogether.

Gutta Percha.

An entirely different product is the gutta percha, which is chiefly used as insulating material in the manufacture of submarine cables.

The best quality is produced from Palaquium oblongifolium on an estate in Java, belonging to the Government. This estate, Tjipetir, covers 1.348 H. A. and has a yearly production of about 100 tons of gutta percha.

Coffee.

The coffee culture has, since centuries, been one of the oldest export industries of Java. There was even a time, when the cultivation of coffee and the deliveries of the product by the population were made compulsory by the Government.

In this way the Government coffee culture was established, which was only completely abolished in 1918. Besides this Government undertaking, several private estates were established.

At the end of 1922 the number of coffee estates amounted to 370, of which 92 in the Outer Districts.

On the estates in Java 47.379 H.A. were planted exclusively with coffee and 14.948 H. A. in the Outer Districts.

Estates, growing intermediate crops besides coffee, covered 52.955 H. A. in Java against 11.684 H. A. in the Outer Districts.

The production for 1922 of the 370 estates amounted to 40.557 tons (of 1.000 K. G.), for 1923 it is estimated at 54.130 tons.

Coffee belongs to the so=called hill cultures. The coffee industry has al=ways more or less had to suffer from serious diseases and plagues, but notwith=standing this, it has come out with flying colours.

Originally the estates chiefly went in for the cultivation of the so=called Java Coffee (Coffea Arabica).

Owing however to the severe ravages, caused by the coffee leaf blight (Hemileia vastatrix) it was decided to plant Liberia Coffee. But it was soon found out, that even this plant was not immune against the disease, so that was looked out for a stronger specimen of coffee, which was found in the Robusta coffee, introduced from Africa in 1901.

Besides the estate coffee, there is the product grown by the natives, which, especially in the Outer Districts, is of great importance. The latter supplied in 1922 about 1/4 of the total coffee export of the D. E. Indies.

In the native gardens in some of the districts of Sumatra, Celebes and the small Sunda Islands, one will invariably find a few coffee shrubs, mostly of the Coffea Arabica kind. Here and there even special coffee gardens have been laid out. This coffee is marketed in small quantities and exported under the name of the district they come from. This native coffee is of supe=rior quality and fetches high prices.

It is only in the Palembang districts of Sumatra that one finds a real extensive native cultivation of Robusta coffee. On a smaller scale this coffee is also grown on Sumatra's West Coast by the native population, next to the superior Padang Coffee.

In Java, coffee estates are found especially on the east side of the island in the districts of Besuki and Pasuruan.

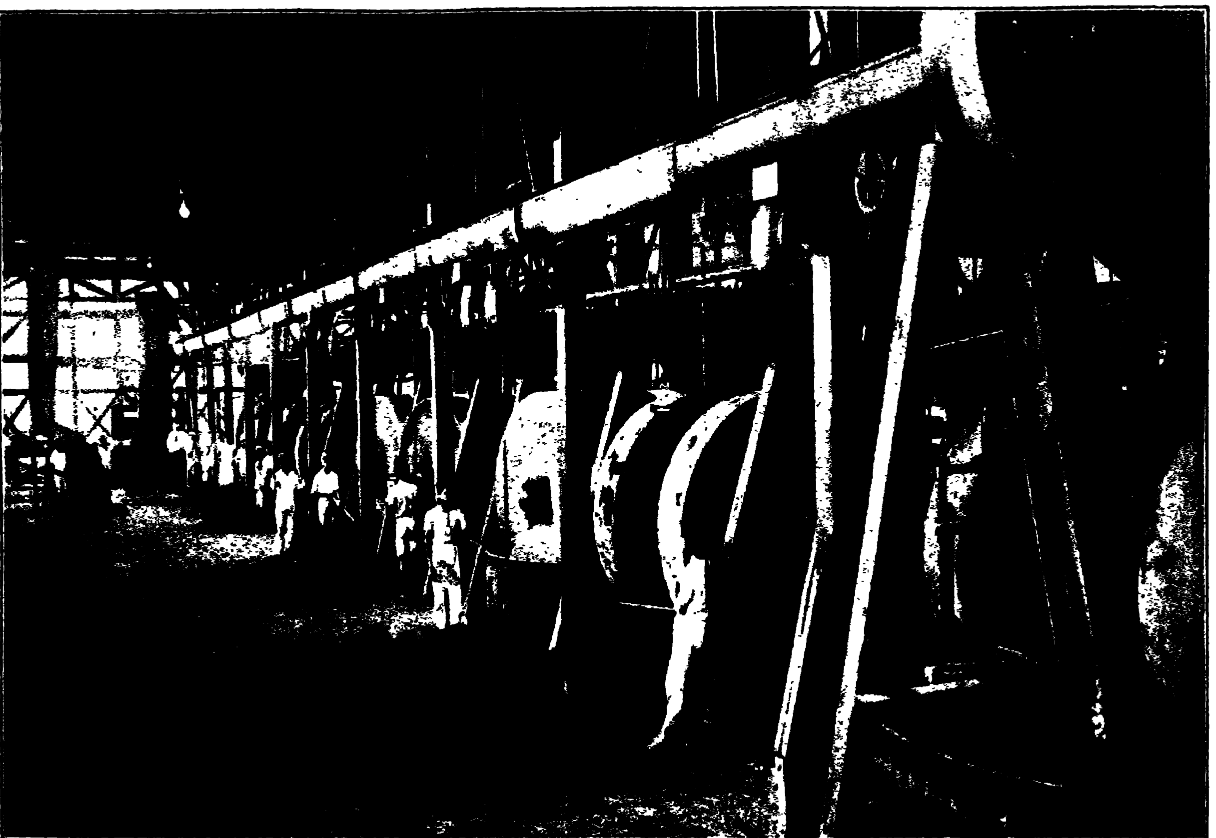
Tea.

Tea is a hill product of more recent date than coffee is, but certainly not less important.

In Java this industry has developed itself especially on the highland of the Preanger Regencies (West=Java).

During late years tea has also been grown on estates on Sumatra's East Coast and this industry is rapidly extending there.

The number of tea estates at the end of 1922 amounted to 284, of which there were 256 in Java and 28 in the Outer Districts. The total planted area



GUTTA PERCHA FACTORY TJIPETIR. CRUSHING OF THE LEAVES

was 92.991 H. A. of which there was 81.007 H. A. in Java and 11.984 H. A. in the Outer Districts.

The kind of tea grown in the Dutch East Indies is the so-called Assam tea; the leaf is almost exclusively used for the manufacture of black tea.

The production of the estates has, in connection with the world conditions during late years, shown great fluctuations, but can be estimated for Java and Sumatra at 49.000 tons in 1923.

Encouraged by the Government, the native population of the Preanger Regencies went in for tea growing, laying out extensive tea gardens, in the same way as the European estates.

The product from these gardens is bought up by the estates and by Chinese manufactures, who erected factories in these districts in connection with those gardens. The gardens cover a surface of about 19.000 H.A.

Tobacco.

For the world's trade, the tobacco from Sumatra and the Vorstenlanden (in Central Java) is of great importance. The leading place is occupied by growers on Sumatra's East Coast, who specialize in the production of a superior wrapper.

The product there is grown exclusively on large European estates.

The second centre for the tobacco industry is Central Java, where, in the so-called „Vorstenlanden", the tobacco is also grown on estates.

Furthermore, especially in East Java, a system is in force, whereby the product, after it has been grown independently by the native population, but with the advice and support (by supplying the seeds etc.) of the local estates, is bought up by these estates.

Besides this industry, which works for the European market, over the whole Archipelago one finds native tobacco estates, which cater especially for the local markets.

The total area planted with estate tobacco in the Dutch East Indies was 46.910 H. A., in 1922 of which 18.998 H. A. in Sumatra.

Besides about 100.000 H. A. in Java were planted with native tobacco.

Cinchona.

Java practically has the world's monopoly of the cinchona bark production. This product is exclusively grown on estates on the slopes and the high table-land of the highest mountains, especially of the Preanger Highland.

The plant was first imported on a fairly large scale from South America in 1854. Originally the Government, which had laid out an experimental estate at Tjinjiruan in the Preanger Regencies, was the only producer. But about 1877, when there was not the slightest doubt any more as to the favourable results, which had been obtained, many estates went in for it. Cinchona is also grown in Sumatra.

The number of cinchona estates in Java at the end of 1922 amounted to 125 and in Sumatra to 13. In Java 15.372 H.A. were planted exclusively with cinchona and in Sumatra 1.461 H. A., while respectively 176 and 148 H.A. were planted with cinchona, mixed with other crops.

The production of dry cinchona bark in 1922 amounted to round about 9.000 tons. The selected cinchona trees (C. Ledgeriana and C. Succirubra), grown in Java, produce practically twice as much quinine as the tree growing in the mother country Peru and elsewhere.

Owing to this circumstance and the fast extension, which the cultivation obtained, there soon was an overproduction. Furthermore practically all the bark had to be sold to Europe, where the quinine was extracted from it by the manufacturers, who had joined together and could regulate the prices as they liked. To fight this vicious circle, a quinine factory was erected in Bandung in 1898, while at a later date the cinchona planters joined forces and closed a joint agreement as to the fixing of the price of the bark to be delivered to the quinine manufacturers.

In this way a satisfactory commercial arrangement was obtained for the industry.

Cocoa.

Though Java produces an excellent quality of cocoa, this culture does not seem to have increased to a large extent, on the contrary there are distinct signs of a decline.

The native population also goes in for the cultivation of this product, but on a small scale.

The number of cocoa estates at present only still amounts to 25, all situated on Java.

The area planted with cocoa only amounted to 2.154 H. A. in 1922, whilst 4.568 H. A. were planted with cocoa, combined with other crops. During 1922 the estates produced about 920 tons of cocoa and for 1923 the estimation gives the same figure.

Fibre.

Of far greater importance however is the cultivation of fibre. The chief kinds of fibre cultivated are kapok and the agave fibres viz. sisal and cantala hemp.

The agave fibres are exclusively grown on the large estates, whereas the kapok, on the other hand, is essentially grown by natives. There are however also some kapok estates.

The planted area of the fibre estates in 1922 amounted to:

for kapok (exclusively in Java) unmixed 1.759 H. A. and mixed 7.469 H. A.;

for agave the total planted area amounted to unmixed 9.138 H.A. mixed 25 H.A.;

These figures however are not complete, as three large estates in Java furnished no information.

In the Residency of Sumatra's East Coast the cultivation of agave fibre is extending rapidly.

When considering the figures given for kapok, one should not lose sight of the fact, that the data only represent a fraction of the total plantation, as the bulk is owned by the natives, and is not contained in these statistics.

The Java kapok is by far the most superior one of all the kinds of kapok.

The tree (Eriodendron anfractuosum) is cultivated all over the island, but in connection with the long period of drought, which is necessary for the ripening of the fruit, the climate in the middle and the eastern part of the island is more suitable for a good production than the more rainy West Java districts.

Further, cotton is grown, but only by the natives in Central Java and in the Outer Districts (Palembang, Flores).

4.200 H. A. of native cotton were harvested in Java during 1922.

The Palembang cotton has a coarse fibre with short staple and is almost exclusively shipped to Japan.

The cotton grown in Flores has a longer staple and is of about the same quality as the good American middling.

The crop is however insignificant and is mainly shipped to Great Britian and Japan.

Coconuts.

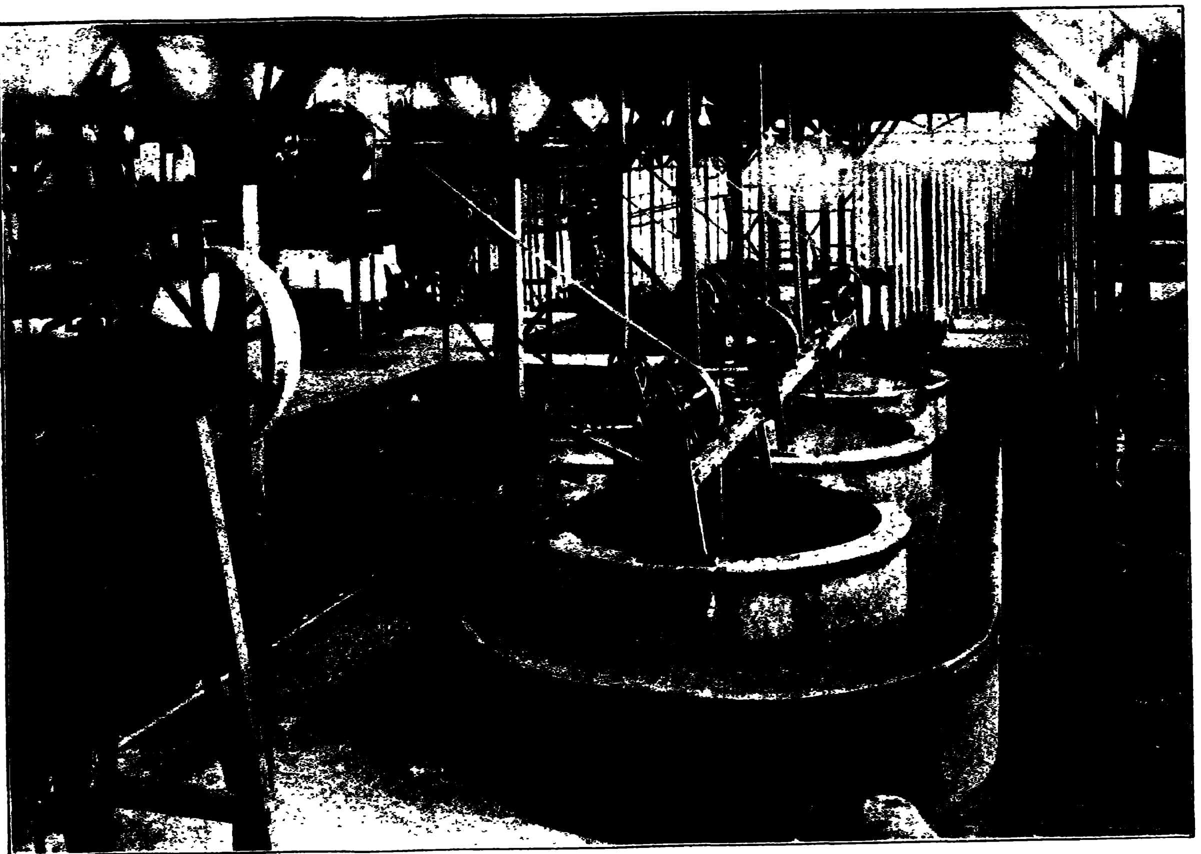
The coconut palm (cocos nucifera) is an exceedingly valuable plant for the tropics. Though chiefly a native grown product, it has during the last 10 years aroused a lively interest with the European growers.

The number of coconut estates at the end of 1922 amounted to 461, of which 149 were in Java and 312 in the Outer Districts. The acreage planted with coconut palms only amounted to 9.769 H.A. in Java and 32.889 H. A. in the Outer Districts, while 2.150 H. A. in Java and 1.143 H. A. in the Outer Districts were planted with coconut palms mixed with other crops.

The European estates however, are quite insignificant compared with the native plantations. No reliable data however are available as to the latter ones. A census held in 1917 gave a total number of 63 million coconut trees in Java and 44 million trees in the Outer Districts. These figures, however must be considerably higher by now, considering the extremely favourable years which came for the copra trade after 1917, the year of the census.

Oil Palm.

The oil palm, as an estate product, has aroused great interest during late years. Especially on Sumatra's East Coast and in Acheen the industry has greatly increased. Soil and climate seem to be especially suitable for the



GUTTA PERCHA FACTORY TJIPETIR. EXTRACTION OF THE CRUSHED LEAVES

cultivation of this product, while by a very strict selection, an especially fertile variety of oil palm is planted there.

There are 62 estates, which cultivate oil palms, of which 13 are in Java and 49 in the Outer Districts.

These estates in 1922 had an acreage of 16.703 H.A., of which 3.812 H.A. were in production.

373 H. A. in Java and 13.494 H. A. in the Outer Districts were planted with oil palms only, while 28 H.A. in Java and 2.808 H.A. in the Outer Districts were mixed with other crops.

NATIVE AGRICULTURE.

Rice.

Rice is one of the chief articles of food for the native population of the main part of the D. E. I. and in every regard the main product of the native agricul= ture. The growing of rice has, especially in Java and the islands of Bali and Lombok, reached a high stage of development.

The rice is mainly planted on irrigated fields. In some of the districts, however, the rice is grown on fields dependent on rain; especially in the Outer Districts the natives go in to a larger extent for the cultivation of rice in this way. Relatively more rice is grown without irrigation in the Outer Districts than in Java, the output however amounts only to half the output on irrigated fields.

The rice is grown by the small native farmers. It is true that extensive rice fields are in the hands of European and Chinese owners (so=called private estates), but these without an exception, have the population grow the rice in their own way. In Java there is practically no more chance to extend the irrigated rice fields; the total harvest falls considerably short of the needs, while the population increases considerably year by year. With a normal paddy crop the consumption of rice in Java per head and per year works out at about 100 K.G. of which 11 K.G. has to be imported.

The paddy crop for 1922 amounted to about 6.6 million tons of dry paddy (the still unthrashed product), which quantity is about equal to 3.3 million tons of thrashed rice.

This harvest was obtained from about 3 millions H. A. of acreage of irrigated fields, called „sawahs", the production of which amounted to about 6.2 million tons and an acreage of about 350.000 H.A. of non irrigated fields with a total production of 0.4 million tons.

The damage done yearly to the rice crop in Java by diseases and plagues, caused by root rot, boring insects, lice, inundations and drought, amount to approximately 4% of the planted area.

The shortage in the home production of rice was especially felt during

the years of the world war, owing to the restrictions, which were placed on the export of rice from the principal exporting countries.

Maize.

After rice maize is the most important article of food for a considerable part of the population. This plant is grown in the whole Archipelago, but especially in Java, Madura, Celebes and Timor it is cultivated to such an extent, that under normal conditions there is a considerable surplus for export.

In 1922 the total cropped acreage in Java and Madura amounted to 1.573.000 H.A., which was nearly all in the eastern and middle part of Java. The total crop can be estimated at about 1.250.000 tons of dry grain.

Maize is exclusively grown by the small native farmers.

Cassava.

The cassava is a very important food product for the native population, and the cassava products, such as tapioca flour, pearl, seeds and flake are also a valuable export article. These products are manufactured by a few estates, by Chinese, who buy up the crop from the natives, and by native planters. The native plantations covered in 1922 an acreage of 719.210 H.A. in all, with a harvest of about 5.084.000 tons of fresh roots. The bulk of the harvest is used for human consumption and the smaller part is sold by the native population to the Chinese tapioca mills or manufactured by themselves in a primitive way into flour.

Soya-beans.

Soya-beans are a valuable food stuff for the native population owing to their high percentage of albumen.

During the last few years an average harvest of about 100.000 tons has been obtained from an acreage of about 160.000 H.A.

This crop however is far below the requirements of the population, which has made it necessary to import increasing quantities, especially from Manchuria, during late years.

The imports for 1922 came to 115.000 tons.

Peanuts.

Peanuts are not only from a point of export, but also as a foodstuff, of great importance.

The acreage harvested in 1922 in Java and Madura amounted to 187.429 H.A. with a production of round about 170.000 tons of shelled peanuts.

Other important native crops are:

Tobacco, Indigo, Cotton and Sugar Cane. The acreage planted by natives in 1922 was for tobacco 100.000 H.A., indigo 10.000 H.A., cotton 4.200 H.A. and sugar cane 17.500 H.A.

Pepper.

Pepper is an other very important product, which is chiefly grown by the natives.

Where Java was the chief producing country for the other products, the Outer Districts are the home of pepper.

The most important centres of this product are the Lampong Districts in South Sumatra and the Island of Banka, while other important districts are Acheen (North Sumatra), the Riouw and Lingga Archipelago and Borneo.

The peculiar feature on the island of Banka is, that the pepper cultivation is almost entirely carried on by Chinese colonists, who are more thorough in their methods than the natives.

For this reason the crops of the Banka gardens are considerably more abundant, while by preference the so-called white pepper is turned out for which purpose only the choicest ripe fruit can be used.

White pepper is worth 80 to 100% more than the black pepper, the preparation of which requires far less care.

There are only a very few unimportant pepper plantations on estates in Java and the Outer Districts.

Generally the natives only own comparatively small pepper gardens, but the Lampong Districts are an exception to the rule, for there we find in many cases individuals owning such large plots, that they could easily be called estates.

During 1922 the exports of pepper totalled 6.867 tons of white pepper and 26.185 tons of black pepper.

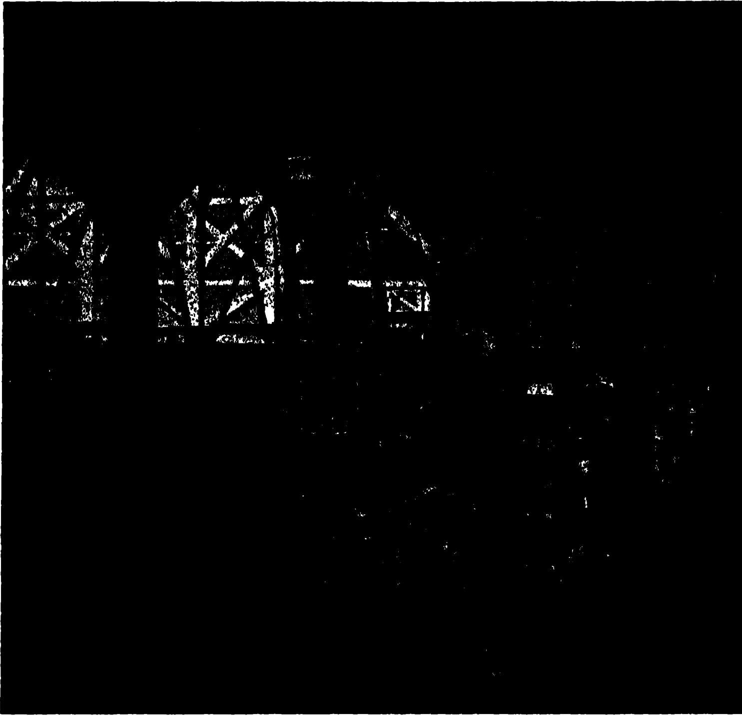
AGRICULTURAL EDUCATION.

The highest school for agriculture in the Dutch East Indies is the Agricultural College at Buitenzorg, where also native agricultural teachers are trained. The school is open to pupils of all nationality, but so far is chiefly visited by natives. Those who wish to be trained for native agricultural teacher receive a scholarship during their studies.

Besides there are in Java two agricultural middle-schools (Cultuurschool) which train students of all nationality for the minor positions on the estates and which also train students for the Government positions of native agricultural overseer and forestry overseer.

The native agricultural teachers are in the first place destined to teach agriculture in the form of courses and for leaders of the vernacular agricultural schools.

The object of the vernacular agricultural schools in districts, which are well adapted for this, is to train by preference sons of well-to-do native farmers, who have had a fair lower education, to become practical farmers.



INTERIOR OF A TEA FACTORY

There are at present 8 vernacular agricultural schools established in Java and 2 in the Outer Districts of the Archipelago.

Also these native agricultural teachers give agricultural instruction to the teachers of the desaschools (rural schools) with the object, that these, in their turn, will give the boys of the village, who are through the desaschools, elementary courses of agricultural education in the afternoon hours.

The latter courses are now already being given in some of the districts and will shortly be extended on a pretty large scale.

The native agricultural overseers are used for the supervision of the field experiments and for assistance in the extension work.

AGRICULTURAL EXTENSION SERVICE.

This service, which has developed greatly in the last ten years, is for the purpose of agricultural education as well as technical information, particularly of the native agriculture and forms the link between this industry and agricultural science by making the results of this science of as much profit as possible, especially to native agriculture, wherever occasion offers.

The staff of the Agricultural Extension Service consists of Europeans as well as of Natives.

Ultimo December 1923 the staff consisted of 32 agricultural advisors, assisted by 48 native teachers, 17 native aspirant teachers, 29 native agricultural overseers and 9 horticulturists.

The staff is distributed over 15 divisions in Java and Madura and 5 divisions in the Outer Districts of the Archipelago.

Every agricultural division is under the supervision of an agricultural advisor, an expert, who nearly always has had a university training.

In future only those, who have received the highest degree of Agricultural Engineer, will be appointed supervisors of the above named divisions.

The work of the Agricultural Extension Service is done by having the assistants get into close touch with the people. By inspiring confidence and interest, by planning and helping to bring about improvements and by information in the broadest sense of the word, native agriculture is aided in its development and the general economical condition of the farmer is improved. The attainment of this goal is striven for, not only by practical instruction, but also by the teaching of elementary agriculture to adults and younger people.

Furthermore experimental fields are being laid out for the purpose of studying agriculture and means of improving the same. The results of these experiments are often propagated on demonstration fields. The demonstrations comprise the improvement of seed and planting material, problems of manuring and tilling, improvement of agricultural tools, the combating of diseases and plagues, etc.

The task of the Agricultural Extension Service staff includes furthermore the researches and the giving of agronomical advice, regarding intended or proposed irrigation projects and the irrigation and agricultural conditions of certain districts, the compiling and controlling of all kinds of records on agriculturo-technical, economical or phytopathological lines, etc.

The officers of the Service furthermore occupy themselves also with the development of agricultural associations, co-operations or other associations, for the furthering of the material interests of the native farmers; they control the data of the agricultural statistics and are the advisors of the officers of the civil service, as far as the planning of measures for the furthering of agricultural interests is concerned.

For the advancement of the fruit culture and the cultivation of vegetables, about 10 horticulturists are attached to the Agricultural Extension Service. At various places in Java as well as in South Celebes and on Sumatra's East Coast, model fruit gardens have been laid out for the demonstration and cultivation, from which superior seeds, seedlings, grafts etc. of improved kinds of fruit are distributed. The principal gardens are in the districts Pasuruan and Batavia.

For the improvement of the vegatable culture, seeds are imported from Europe and are distributed to growers.

Three experts are stationed in various places in Java in the interest of the fresh water fisheries.

THE GOVERNMENT RUBBER INDUSTRY.

This industry, being one of the most important rubber plantation concerns in the Dutch East Indies, has been developed from experimental rubber plantings, started on a large scale since about 1900 by the Forest Department in various forest districts, scattered over the whole of Java. All kinds of rubber producing trees, Hevea Brasiliensis, Ficus elastica, Castilloa elastica, Manihot Glaziovii, etc. were cultivated. Unfortunately Ficus elastica was preferred, owing to the opinion, that this indigenous tree would give the best results by the extensive exploitation, that was intended, and for that reason the greater part of the area was planted with Ficus.

In 1911 the total area of these plantings had increased to such an extent, that a special organization had become necessary, the more so, as on the basis of extensive exploitation, no profit could be expected from the business. Consequently the rubber area was separated from the forest area and given to a special service and the various plantations were combined and gradually enlarged, until estates of sufficient size were obtained.

Later on the Government Rubber Estate Langsa (Sumatra) and the Government Gutta Percha Plantation Tjipetir (Java) were also added to this service.

The extension of the plantations was continued until 1911, when the less favourable aspects of the rubber industry all over the world, made it advisable to suspend extension until further notice.

As long as the rubber prices were very high, the exploitation of Ficus elastica certainly paid fairly well, but after prices had undergone a sharp decline in 1913, the yield being poor and the cost price high, it proved necessary gradually to cut down the whole area of Ficus (a total of 3.035 H.A.) and convert it into Hevea.

The Government Rubber Industry has in some degree contributed to the development of the rubber industry in the Dutch East Indies, many valuable experiments on cultivation, harvesting and preparation were made in collaboration with the Experimental Stations. But in the first place it is a commercial business with an organization that is, as far as possible, similar to that of private enterprise. Thus, for instance, the staff is interested in the financial results.

Owing to the low rubber prices of 1920 and following years, which unfortunately occurred just about the time that the largest area came into full bearing, the financial results of the industry until now, did not yet come up to expectations.

Nevertheless, the present satisfactory prices, the good condition of the estates and the low cost price, give every hope that in the following years large profits will be obtained for the Government.

The following figures show the importance of the industry, which now consists of 14 rubber, 1 coconut and 1 gutta percha estates.

YEAR	PLANTED AREA IN H.A.					RUBBER PRODUCTION IN K G.	GUTTA PERCHA PRODUCTION IN K G	CAPITAL JANUARY 1ST IN 1.000 GUILDERS
	FICUS	HEVEA	GUTTA-PERCHA	COCO-NUT	TOTAL			
1920	518	9.561	1.332	1.061	12.472	1.408.810	77.844	8.874
1921	518	9.508	1.362	1.061	12.449	1.551.460	79.290	10.184
1922	—	9.480	1.348	1.048	11.876	2.052.319	100.008	11.302

At the end of 1922 the area under rubber amounted to 9.480 H. A. of which 7.147 H. A. or 75.4% were in production. The estimates of the output of rubber for the next years are:

1923 .... 2.700 tons.
1924 .... 3.250 „
1925 .... 3.500 „
Full production ...... 4.000 „

Almost the entire production is delivered in crêpe form.

Particulars about the gutta percha plantation are given below.

THE GOVERNMENT GUTTA PERCHA PLANTATION „TJIPETIR". (JAVA).

It was the extension of the system of submarine telegraph cables, which drew the attention to the probability of a scarcity in gutta percha — that most important factor in the manufacture of these cables — because it proved impossible to put a stop to the native methods of collecting, which threatened to lead to the extermination of gutta yielding trees.

After an investigation on the natural supply of gutta percha, since 1884 attempts were made to cultivate the gutta percha producing trees (Palaquium spec.). These plantations were first laid out in the Agricultural Garden at Buitenzorg and later, on a larger scale at Tjipetir, near Tjibadak.

These experimental plantings, which still exist, have grown into big trees and supply the seeds, required for further extensions of plantations.

The results obtained at Tjipetir were satisfactory enough to induce the Government in 1900 to lay out large plantations there, so as to meet the demand for gutta percha in case the production of the wild product should decrease too rapidly; but besides, to demonstrate the productivity of planting gutta percha, thus setting an example to private enterprisers.

It soon appeared that from the tapping of the trees no profit could be expected. Therefore, after a short time, efforts were made to extract the gutta percha from the leaves and young twigs. This was at first done by chemical



THE BARITU NEAR BANDJERMA' ,OUTH BORN

extraction, but as the quality of gutta percha was inferior, a system of mechanical extraction, without any use of chemicals whatsoever, was adopted, producing an excellent grade of gutta percha. Leaves and young twigs are harvested, both by plucking and by pruning. To that purpose and in order to obtain the highest possible yield, the plants are converted into the shrub type with rich and well developed low branches.

After a very primitive experimental factory had worked during about ten years, a new, up to date and fairly large factory was started in 1922, where very large quantities of leaves and twigs can be extracted. The power is supplied by a hydro=electric plant of 450 H. P.

The harvested leaves and twigs, in which the gutta percha is found in very fine threads, are brought to the factory by carts and trucks (a system of cable transport is now being erected) and then worked as soon as possible.

The manufacture is done by specially adapted machines. The process of manufacture has been gradually improved, both with regard to the average percentage of gutta percha obtained from the weight of the fresh leaves (which now amounts to about 2.3%) as well as to the quality of the product. Formerly the high percentage of very fine particles of dirt (chiefly hairs from the leaves) in the product unfavourably affected its electric properties, but recently the gutta percha before being pressed into blocks undergoes a special purifying process by which that fault is evinced.

At present the quality of Tjipetir leaf gutta percha, as to purity, durability, electric and mechanical properties (tensile strength, resistance to wear, plasticity, adhesive capacity) can compete with and even surpasses the best grades of wild gutta percha.

In the first years, after the estate began to market the leaf gutta percha in comparatively small quantities, it was difficult to find buyers; but as soon as manufacturers had learned to appreciate the excellent quality of the product, it found an ever increasing interest.

Until recently the bulk of Tjipetir gutta percha was used in the submarine cable industry.

This being a rather irregular business and considering the possibility of the technics of wireless telegraphy being shortly improved in such a way that the laying of new submarine cables will be greatly limited in future, efforts were made to find a wider outlet for the ever increasing production of the estate.

It is easy to understand that, as long as no difficulty was experienced in selling the product to the cable=works at high prices, no efforts were made to find another outlet. At present however the cost price has declined so far, that gutta percha can now replace the balata for all kinds of use as f.i. all sorts of insulations, and the manufacture of acid bottles, chemical apparatus, valves, buckets, rings, galvano=plastic purposes, golf balls and belting.

The area planted with gutta percha now amounts to 1.348 H. A. and in consequence of the favourable results of the estate during the last years, further extensions are being considered.

The first yields of well developing new plantings are obtained in the 3rd year, whilst about the 6th year they are in full bearing.

The output from the Tjipetir estate during the years 1920/'22 was:

1920	77.844 K.G.
1921	79.290 „
1922	100.008 „

IRRIGATION.

Introduction.

Java (with Madura) forms so far the most important island of the D. E. I. and it is therefore not surprising, that, what till the present day has been constructed in irrigation works, has chiefly been achieved in Java. Indeed up till now very few irrigation works have been constructed in the Outer Districts, though an increasing activity in irrigation matters has been noticeable there in late years.

The following general outline will for this reason almost exclusively refer to Java. The irrigation works thus far constructed in the Outer Districts were, as a matter of fact, built on the same principles as those in Java.

Rivers.

The rivers in Java have nearly all a short course, which is due to the small width of the island. The largest, the Solo river, though running mostly lengthwise over the island, has only a river basin of 15.400 K.M^2. (5.950 square miles). The length of the Solo river amounts to 540 K. M. (340 miles), and of the Brantas, the second largest river of Java, which shows the peculiarity to run successively in all the four main directions of the compass, to 310 K. M. (190 miles) with a river basin of 11.000 K.M^2. (4.250 square miles). The peculiar characteristics of the rivers in Java are little discharge, sometimes they even entirely drying up in the east monsoon, floods in the west monsoon, caused by the immediately preceding heavy rains. However sometimes there are also large discharges in the first mentioned season.

That also, apart from the sudden overflows, provided the position of the water basin is favourable, the water level can remain fairly high, is proved among others by the Bondojudoriver, which receives its water from the south-east slopes of the Tengger mountains and of which the waterlevel in the east monsoon compares favourably with the one in the west monsoon (½ — ²/₃). Also other circumstances, viz: the nature of the soil of the river basin, exercise sometimes a favourable influence on the waterlevel in the east monsoon.

The slopes of the Klut and its loose upper surface of young vulcanic material is known as being highly water absorbing.

High in the sand streams of this active volcano, the water disappears in the soil to appear again at the foot in a zone of wells, the water level of which only begins to drop in November.

The Merapi and the Slamat are also known as being rich in wells, such as the northern slopes of the Tengger, on which a few springs extraordinarily rich in water, rise at only a few metres above sea level.

As a rule there is however a great difference between the water levels of the east and west monsoons, even in the large rivers.

In view of the increase in newly cleared land being cultivated and the consequent deforestation, the rainfall becomes very irregular, which has been proved most clearly in Java.

Details regarding the river basins, maximum and minimum discharges of some of the principal rivers in Java, are compiled in the following table:

NAME OF THE RIVER	RESIDENCY	SIZE OF RIVER-BASIN IN SQUARE MILES	APPROXIMATE OUTPUT PER SECOND BY		
			NORMAL HIGHEST OUTPUT	EXTRAORDINARY FLOODS	NORMAL LOWEST OUTPUT
			CUB. FEET	CUB. FEET	CUB. FEET
Tjiudjung	Bantam	665	35.000	62.000	710
Tjitarum	Preanger and Batavia	1.500	40.000	—	990
Tjimanuk	Preanger and Cheribon	1.280	25.000	34.000	600
Pemali	Pekalongan	340	25.000	34.000	250
Tjomal	"	290	20.000	65.000	600
Tuntang	Samarang	240	25.000	39.000	600
Serang	"	326	18.000	70.000	600
Solo	Surakarta Rembang and Sourabaya	5.950	70.000	90.000	810
Brantas	Pasuruan Kediri and Sourabaya	4.250	40.000	60.000	2.610
Sampean	Besuki	462	18.000	95.000	390

The width of the rivers is in general not very large, rarely more than 200 — 400 feet; the depth is very alternately, on the lower course of the Solo river at low water, it amounts from a few d.M. to 10 M. and more. The difference between high and low tide in the Solo River amounts to 6 M. on a distance of 40 K. M. from the mouth.



OLD BATAVIA

In a country like Java, especially in the higher regions, with its mostly loose volcanic soil, its moist, warm climate and heavy rains, the water of course carries along a great deal of solid matter: mud, sand and stones.

The highest percentage of mud is shown in the lower Solo river with a figure of 6 and for the Serang river $3^{10}/_{16}$ ounces per cubic feet, while for the Brantas, barring the abnormal condition after the Klut eruption — the last one took place on May 20th, 1919, — $1^{11}/_{16}$ ounce per cubic feet is given. In Holland they found in the Maas at Grave 2, in the Merwede at Gorinchem $1\frac{1}{8}$, while the mud figure for the Mississipi at New Orleans amounts to $2^{11}/_{16}$. The averages of the mud figures however, differ considerably more than the limits. At any rate for the Solo river, one comes to an average of $2\frac{3}{4}$ ounces per cubic feet per year, for the Rhine $1/_{16}$ ounce. Considering that the Solo mud has a specific gravity of only 1.35 against the Rhine mud of 2, it appears that the Solowater is about 60 times more impregnated with mud than the Rhine water. Should it be possible to spread the mud, carried during a year over the whole river basin, it would, in a dry state, form a layer of a thickness of 1.5 m.M. The Solo river would therefore need 8 months to lower her basin about 1 m.M. According to Guppy, the Po requires 2.4 years for this, the Thames 32.2 years and the Rhine 6.3 years.

In the lower course of the Solo river the mud contains 6% sand, that one of the Brantas river 21%.

The rivers of Java, owing to their richness in mud, consequently show a strong property to form higher strips along the banks on the lower course after inundations.

The larger rivers of Java's North Coast all form delta's, which mostly protrude a long way into the sea and often increase rapidly. At the Tjimanuk delta an increase of 3 K.M. has been observed during the last forty years.

The continuous extension of the lower rivers, combined with their high level, caused more and more drawbacks, as the population grew and agriculture was extended, which led to dikes being constructed everywhere in the lowlands.

Nearly everywhere the native population itself, originally started to throw up dikes in a primitive way, exclusively to promote local interests; everywhere however the dikes have been built too close to the river channels.

On Java's South Coast with its deep sea and strong surf no delta's are found.

Agriculture.

Before dealing with the irrigations, something should be mentioned about agriculture, as far as the irrigation system is connected with it.

The chief product of agriculture by the native is rice, the staple food of the population.

Principally there are two methods of cultivating rice in Java, viz. the rice culture on non-irrigated fields, practically only still carried on in scarcely

populated mountain districts, and further the chief method: the rice culture on the irrigated rice fields, which are tracts, laid out in horizontal terraces, surrounded by low dikes to stop the water. This rice culture is partly dependent on rain, but wherever possible irrigation is applied. The rice fields which depend on rain, may turn out good crops, but this chance is changeable and moreover they miss most of the manuring action of the mud and the substances dissolved in it, which are carried away by the irrigation water.

Though the rainfall in Java compared with British India is favourable and calamitous droughts, which use to cause there the periodical famines, fortunately do not occur in Java, for the reasons mentioned above, irrigation must be considered as being of the greatest importance for the rice culture.

The rice fields are laid out as well in the plains as high in the mountains (up to 3 — 4.000 feet altitude, higher up rice culture is not possible), even gradients of 1 : 1 the Javanese manages to turn into terraces for the rice culture. The size of the separate fields, surrounded by dikes varies from a few square metres to an even number of bahoes (1 bahoes is 1 3/4 acre = 7.100 M^2.) in the plains.

The second largest culture on Java's irrigated land is the one of the sugar culture by European enterprises. Regular irrigation in the east monsoon, during which period the cane is planted, to be crushed in the following east monsoon, is a life condition for Java's sugar cane culture. Very little cane is planted by the European estates on non-irrigated land and where this is locally possible, one has to do with loose soil and high water level.

Where sufficient water is available, the native also grows rice again in the east monsoon, so that from some lands year in, year out, twice a year a rice crop is gathered. Where not sufficient water is available during the said season nothing is grown on the heavier soil, while on the lighter soil, so-called secondary crops as maize, cassava, peanuts, soya-beans, sweet potatoes and similar crops, and also, but less generally, tobacco, indigo and cotton is grown.

Native Irrigation Works.

Though irrigation has been indigenous in Java since centuries and has also reached a certain degree of development, the native irrigation works suffer from many defects and the natives were not in a position to make use of the larger rivers for irrigation purposes without foreign assistance.

The objections to the native irrigation works are chiefly the following: in the first place, the mostly primitive construction of the weir in the river, with, as a consequence, repeated breaches, whereby the river bed and banks at this spot were gradually entirely destroyed.

In the second place the open intakes, whereby when floods occur, the water enters in large quantities and damages the canals, even to such an extent, that the original canals of supply often turn into new river arms, while the real river beds gradually loose their discharging capacity.

In the third place the receiving in the main canal of the crossing discharge canals by damming the original watercourse, while as a rule none or only very insufficient spillways are constructed.

The latter two defects are the cause, that the irrigation canals are not only badly damaged, but also that somtimes heavy inundations occur in the plains.

The fourth objection is, that in the level districts, very often no distinction is made between supplies and discharges, so that in some districts, where the soil is mostly clayey, by obstruction in the water discharge and drainage, the crops may suffer, causing diseases, while on the other hand the irrigation is also disturbed each time by inundations, whereby the primitive weirs in the mixed canals are damaged or carried away entirely.

The consequence of the afore mentioned defects is, that in the long run nearly all big native irrigation works degrade more and more and continuously cause greater difficulties.

However a considerable part of Java's irrigations still exist, especially in the mountain districts, of such primitive works, but at present these have nearly all been placed under technical supervision, so that these defects can be rectified as soon as possible.

Oldest technical works; development of the irrigation system.

Also before the creation of the Public Works Department, which took place in 1854, the Government has continuously more or less promoted the irrigation system. Ignorant of local conditions, mostly without proper details concerning the riverbasin, rainfall, outlet and not having sufficient experience of the power of the tropical floods, the Dutch civil engineers were at that time not always lucky with the results of their exertions.

Works, extant to this day, were also created in those years, of which the principal ones have been the works for the improvement of the hydraulic conditions in the delta of the Brantas river in the Residency of Sourabaya (the so called Sidoardjo delta) for a total surface of 48.000 bahoes.

This important work however did not form a complete irrigation system, as it only provided for the main water supply.

The first irrigation works, completely téchnically prepared, designed and carried out, were constructed thirty years later. They are the Demak waterworks in the Residency of Samarang, having in view the prevention of further extensive crop failures, which in those districts had already repeatedly led to famine.

The Demak waterworks gave the push to and served as an example for further complete technically designed irrigation works in Java.

The execution of complete irrigation works has been continued without a break since 1885, though not always with great speed, because for a long time, many were of the opinion, which sometimes was also shared by the Government, that such works would entail more costs than benefits. The circumstance, that in the D.E.I. up to now, nothing is charged for the use of the irrigation water and also in another way on account of the working of the



DAN AWAN

tax system, the increased crops, after the execution of the irrigation works, are not clearly shown to the public in increased Government revenue, has undoubtedly led to the spreading of this unfavourable opinion.

During late years the necessity of a good irrigation system has more and more gained ground, which is shown in the annual amounts spent on irrigation and drainage works, which, after a small decrease in the beginning of the great world war, show a considerable increase, to fall back again in the last few years, due to the necessity of a general cutting down of the Government expenditure.

Below follows a table of the amounts spent during a few consecutive years for construction, upkeep and repairs of irrigation and drainage works.

EXPENDITURE ON IRRIGATION AND DRAINAGE WORKS.

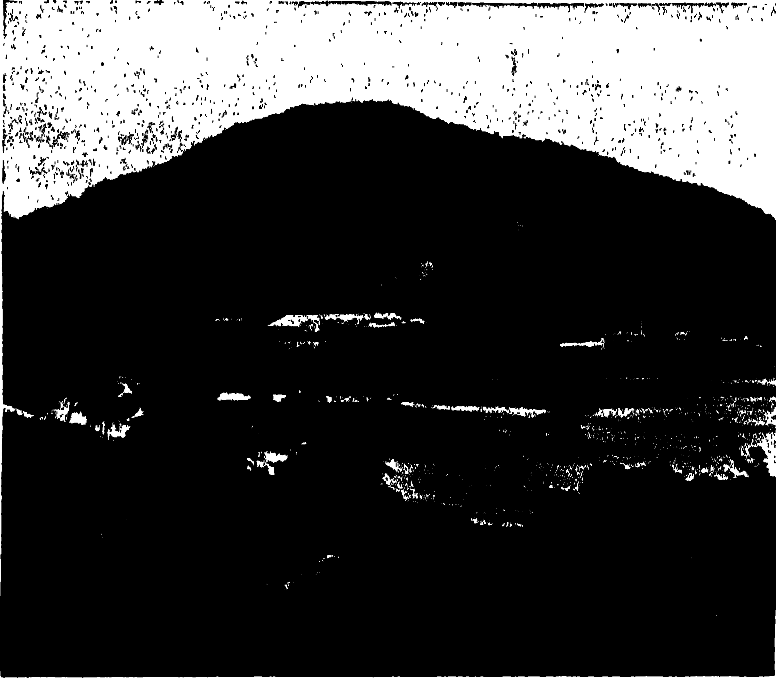
YEAR	CONSTRUCTION	SURVEYS	ORDINARY UPKEEP	REPAIRS
1914	glds. 5.389.392	glds. 448.074	glds. 710.323	glds. 75.266
1915	„ 4.347.775	„ 329.006	„ 1.079.880	„ 106.787
1916	„ 5.093.431	„ 414.293	„ 1.504.586	„ 143.902
1917	„ 6.294.136	„ 440.383	„ 1.352.326	„ 145.019
1918	„ 7.275.129	„ 464.410	„ 1.466.571	„ 185.290
1919	„ 7.696.172	„ 460.873	„ 1.658.456	„ 348.387
1920	„ 8.500.904	„ 620.115	„ 1.837.780	„ 599.573
1921	„ 8.805.506	„ 647.173	„ 1.792.130	„ 498.663
1922	„ 5.586.682	„ 446.259	„ 2.026.042	„ 524.842

General installation of an irrigation district.

The district, irrigated by a river, is subdivided into secondary squares, which as a rule are bordered by discharge canals, the size of which in connection with this, depends on field conditions. The secondary squares are again subdivided into tertiary squares, the so=called terminal squares. In these terminal squares, the size of which lately is fixed as much as possible at about 150 bahoes, the irrigation water is led on the land to be irrigated, direct from the so=called tertiary canals.

From the feeding river the water is led by means of a weir (which however is not always necessary) with an inlet sluice into the main canal. By means of distribution sluices, the water is brought into the secondary canals, which divide their water with the help of tapping sluices among the tertiary canals of the terminal canal.

The crossings of the irrigation canals with roads and waterroads takes place by means of culverts, aqueducts or bridges. Superfluous rain=water is



CHEST FACTORY AT SABANG (PULU WEH)

removed by spillways from the main canals and led into discharge canals. Finally the irrigation canals are provided, wherever necessary, with gauges, in order to be able to divide the irrigation water among the different canals.

For the discharge of the used irrigation water and the rain water, an irrigation district is furthermore provided with the necessary discharge canals.

Required quantities of water, capacity of the canals.

The capacity of the canals is regulated according to the crop requiring most water, the rice; this culture requires, that the fields are inundated and kept in such a condition for quite some time.

The quantity of water required for this, largely depends upon the conditions of soil; in the first place on the porosity of the soil, further on the gradient of the land and the height of the ground water, which again depends upon the local rainfall.

The comparatively small quantity of water, which the plant absorbs during its growth and the quantity, which is lost by evaporation, which is about 0.32 liters per bahoe and per second during the west monsoon, the season when the rice is chiefly grown, may be considered as practically stable for the whole of Java.

It is entirely different however from the quantity, which penetrates into the soil and disappears in this way. This variable quantity is the cause, that the

quantities of water required in the different irrigation districts, very often differ to a great extent.

Still as a rule a water supply of 1 — 1.25 Lbs (liters per bahoe per second) for the period of the full irrigation can be considered as sufficient in the plains. As an example of the course of the water requirements for the rice culture, we will deal here with those in the Pemali irrigation district (Residency Pekalongan).

At the commencement of the culture, water is first required for the working of the nursery beds, which take about 1/8 to 1/10 of the total area to be planted. A period of a fortnight is required for the laying out of nursery beds of average size, during which time for each bahoe of nursery bed during 24 hours 35 Lbs of water is required for the soaking of the dried up ground; once the soaking has taken place, not much more water is required.

This quantity tallies with a supply to the main canal of $1/8 \times 35/14 = 0.3$ Lbs.

The time, during which the seedlings remain on the nursery beds, before being transplanted, is about 45 days, which time is used to work the rice fields. For this, also fort the transplantation, a supply of 1 Lbs. is necessary during a month and a half, after which during three months 0.7 Lbs is required. Afterwards the plant needs a couple of weeks to ripen, during which time however no water is required.

By combining the various main canals of an irrigation system into groups, which do not start the rice culture at the same time, but at various intervals, one can succeed in connecting the required quantities of water as much as possible to the regimen of the feeding rivers, while it is also possible to restrict the capacity of the main canals.

The Pemali district is divided into five of such groups, which each time start the culture with a space of half a month, with the exception of the last two groups, which, if possible, and this is generally the case, are worked at the same time.

Discharge canals, re-use of used water.

The improvement of the irrigation by the construction of technical works is nearly always, at any rate always in the plains, followed by the improvement of the local drainage, while also in the lowlands one very often has to make an alteration in the course of the larger rivers and to dig, outside their delta, a shorter new mouth to the sea, so as to be protected from floods and inundations by the rising of the high water.

Also with the construction of entirely new irrigation works in still undeveloped districts, often considerable works were found to be necessary for the drainage of the water. This is especially the case when bringing into cultivation the swampy jungle districts in which it is not a rarety, that the riverbeds mostly run blind.

The construction of water protecting dikes along the big waterways in Java's lowlands, cannot, as a rule, be eliminated.



DANCING GIRL

When improving irrigation works, this, as a rule must be provided for, a provision, which may cause a considerable expenditure, owing to the mostly dense population of the river banks. This circumstance often makes it cheaper simply to alter the mouth of the river.

In the construction of the older irrigation systems, the view was taken, that the irrigation water, which reaches the discharge canals should not be used anymore for irrigation purposes. Though this objection was not always based on the fear, that the used water should be injurious to agriculture, one was still of the opinion, that the so much more salutary fresh water with the foodstuff floating and dissolved in it, should be used exclusively on all soil of an irrigation district, even if the quantity of water, available for each bahoe, would be greatly reduced by it. Also it was feared that the necessary leveling up of the discharge canals, when re=using the water, would have an unfavourable influence on the general drainage conditions and would eventually lead to diseases in the crop.

Later on this principle had more or less reluctantly to be dropped. The population itself gave the example in this instance, by secretly damming the discharge canals in the rainy season, which naturally, threatened to call into existence again the same objections, which one tried to avoid by intro=ducing the improvement works. Also the quantity of water, accumulating in the discharge canals, sometimes proved to be much more than one had imagined. At present one hesitates no longer, wherever necessary or advisable, to use once more the water from the discharge canals into which movable weirs are constructed for this purpose.

Below follows a table of the total area of the irrigated districts in Java and Madura at the end of 1919.

	NUMBER OF H.A.	%
1. Irrigation districts, for which permanent works have been put in use.	803.346	21
2. Dito, for which permanent works are under construction.	239.417	6
3. Dito, for which permanent works are being studied or planned.	544.218	14
4. Irrigated land and land dependent on rain, for which no plans exist.	233.000	59

Irrigation from reservoirs, by means of pumps etc.

Very little has come so far of the construction of large reservoirs in Java. In connection with the rainfall in the west monsoon, favourable for the rice, though irrigation is of the highest importance for this crop, the costs of con=

struction of large reservoirs, generally speaking, would be too high, to be paying for the rice culture at any rate in comparison to the revenue with the present native system of production.

This is still less the case with regard to the so-called secondary crops (maize, cassava, etc.). It is different with regard to the European sugar-cane culture, in the interest of which repeatedly plans have been brought forward for the erection of large reservoirs.

The condition of the soil is on the whole not very favourable for the construction of large reservoirs. The slopes of the volcanoes are generally too porous for large reservoir dams, for which they offer indeed little opportunity, while in the tertiary hill districts the marl and chalk formations very often do not offer a safe base to reservoir dams, while one also has to reckon with the manifold earthquakes in some of the districts, so that very little has come so far, of the various plans for the erection of large reservoirs.

The largest reservoir built, up to now is the Wadoek Pridjetan in the Solo valley with a capacity of 9 million cubic Meter, constructed in the valley of the small river of the same name, which in previous years, caused a lot of trouble, owing to the sometimes heavy floods and the inundations caused by it.

There are several smaller reservoirs in Java, constructed by the natives, especially in districts, where the rainfall is poor, such as in the Solo valley; they are mostly formed by damming small valleys. Also a few crater lakes are used on a small scale as reservoirs, as for instance the lake of Ngebel in the Residency of Madiun, on the west slopes of the Wilis, and the small Telaga (lake) Pasir on the east slopes of the Lawu in the same Residency.

Irrigation by means of pumps has not been found paying so far for native plantations, but is very much applied for the sugar-cane fields of the European sugar estates. As a rule, the water which collects in the discharge canals is profitably used again by pumping it to the sugar-cane fields by simple easily removable centrifugal pump installations.

On a large scale, water is pumped from the rivers by stationary pumping stations (of which are many with a capacity of 1 M^3 per second) to supplement the output of the irrigation canals and sometimes also to feed small irrigation canals which have been especially constructed for the irrigation of complexes of sugar-cane estates, which otherwise would not receive any irrigation water. The pumping of artesian or ground water for irrigation purposes, such as on the Hawaian Islands is carried out on such a large scale, is only done by a few sugar estates and even then only on a limited scale.

Flood protective works.

A factor, which is of the greatest interest for all cultures is the care for a regular discharge and protection against the water, so that, besides irrigation and discharge works, also embankments have been constructed or are under construction. The most important flood protective works constructed for

this purpose, are those to prevent floods from the Solo and the Brantas river, also those to safeguard the capitals Batavia and Sourabaya from floods.

Finally a few words should be said about the struggle against the unfavourable effects of the material, discharged by the active vulcanoes. The rivers rising from the slopes of these vulcanoes, sometimes change into veritable sand- or mud-rivers, which, in leaving the original bed, destroy everything that is in their way.

As regards the Klut it is a highly unfavourable circumstance, that a lake is always formed in the crater, the water of which is thrown out with an eruption, immediately forming mudstreams, causing death and destruction. The great loss in life and the enormous damage caused by the last eruption in 1919 by this volcano has led to an effort, which is now being carried out by the Service of the Mining Department, to cut a tunnel through the vulcano slope, which will make it possible to drain the crater. Should this effort succeed, for which is every chance, most certainly a very beneficial victory will have been gained on nature.

Besides the Klut, especially the Smeru (Residency Pasuruan) and the Merapi (Residency Surakarta), the excrements of which cause a lot of damage, are a danger and nuisance and necessitate continuous watching and interference. The fighting of the so-called sand trouble of many of the rivers, rising from the slopes of these mountains, belongs to the heaviest and unfortunately most thankless task of the hydraulic engineers in the D. E. I.

Below follows a survey of the expenditure on construction, upkeep and repairs of dams during a few successive years.

EXPENDITURE ON FLOOD PROTECTIVE WORKS.

YEAR	CONSTRUCTION	ORDINARY UPKEEP	REPAIRS
1914	glds. 901.214	glds. 123.885	glds. 41.100
1915	" 790.202	" 142.131	" 1.131
1916	" 826.516	" 153.061	" 120.148
1917	" 1.018.365	" 172.710	" 224.646
1918	" 2.069.224	" 198.558	" 465.878
1919	" 1.336.957	" 275.415	" 252.860
1920	" 1.484.554	" 271.630	" 442.347
1921	" 1.915.609	" 241.989	" 169.749
1922	" 1.364.621	" 221.041	" 28.214

Organization of the irrigation service.

Irrigation, drainage and flood protective works were, so far, almost exclusively constructed by the Government under the management of the



OLD CANAL AT BATAVIA

Department of Public Works, as its technical section for irrigation, drainage and flood protective works is more especially in charge of these works.

The technical irrigation service resorting under this department are, as far as Java and Madura are concerned, to be distinguished in:

I. Service of construction (special services) and
II. Service of exploitation (irrigation sections).

I. Services of construction.

These are, in the first place in charge of the making of surveys, measuring of water quantities and other observations, the designing and estimates of plans and the execution of works of the above described nature.

The leader is a chief=engineer or engineer, who is directly subordinate to the Chief of the Department and who has a staff of personnel (engineers, architects, surveyors, native superintendents and foremen).

Even after new works have been partly finished, the exploitation of these is, for the time being, put in charge of the construction service, which afterwards gradually, partly or entirely passes into the exploitation service.

II. Services of exploitation.

For the exploitation of the irrigation works, irrigation sections have been created in Java, which comprise in general the stream and irrigation district of one or more large rivers and derive their names from these rivers.

Probably in due time, Java will be divided altogether in such sections.

A chief=engineer or engineer is in charge of an irrigation section, who in technical matters is directly subordinate to the Chief of the Department, but from an administrative point to the relative Resident(s). He is assisted in the management of the irrigation works by the heads of the section, in which the irrigation sections have been subdivided, and by engineers, architects, surveyors, native superintendents, foremen etc.

Besides the management and the exploitation of all irrigation works and waterways within their district, the chiefs of the irrigation sections are also charged with the surveying, designing and construction of waterworks within their territory, as far as no special construction service has been appointed for it, while sometimes they are also in charge of the construction of roads, and in exceptional cases also have the supervision of small harbours.

Agricultural advisors, who are stationed in most of the residences, take care of the agronomical interests of the irrigation system about which they give advice to the Residents or also direct to the Irrigation Engineer.

The water supply is based on strict regulations, while heavy penalties are imposed for any offence against these regulations.

At the beginning of 1923 the personnel of the Irrigation Service in Java and Madura consisted of: 100 Chief Engineers and Engineers, 9 Architects and 176 surveyors.

THE FORESTRY SERVICE.

The care of the forests is assigned to the Forestry Service of the Department of Agriculture, Industry and Commerce.

For nearly 80 years, trained forestry officials have been active in Java. The forestry there has consequently reached a much higher stage of development than in the Outer Districts where, until a few years ago, there was no question about an actual forest control and even at the present time this is still in the experimental stage. A separate discussion of these two regions is therefore desirable.

Forest control in Java.

The proceedings of the forestry service may be divided into:

forestry organization, in which is included the regulation of forest boundaries, the surveying and mapping of the forests and the laying down of working schemes;

the *actual forest management*, including proceedings for the exploitation and re-afforestation of the cleared tracts and other areas under consideration,

the *forest guard* and

the *scientific forestry research*.

Until a short time ago, the management of the Government rubber estates was also assigned to the Forestry Service, but since 1919 the Government Rubber Industry has formed a separate branch of service.

Forest organization and management.

With regard to forest organization and forest management the forests are classified as teak and wild timber.

A. The teak forests in Java.

The most important forests for the timber supply are the teak woods. They consist entirely or for the most part of teak (Tectona grandis L.) and produce the worldknown djati- or teak wood. They are chiefly found in the lower hill regions of Central and East Java; at more than 600 M. above sealevel the growth is unsatisfactory. The climate in the teakwood regions is marked by a pronounced dry monsoon; in West Java, where the rain is more evenly divided over the year, few teak forests are found. In the dry season the teak sheds its leaves, the forest looks withered and bare and serious leaf-fires are easily started, which, in the long run, cause the soil to deteriorate, for which reason at the present time the most careful precautions are taken against fire.

Teak does not require a very fertile soil, but is sensitive to a poor condition of the soil, such as swampiness or lack of penetrability.

Teak is used for many purposes. The durable, strong and relatively light wood is used for ship-building and furniture making. It resists white ants and is therefore especially suitable for house building in the tropics and for sleepers.

For these reasons the teak forests have been exploited since early times. Gradually the natives were compelled to chop and transport the trees. For centuries, however, very little was done to preserve the forests, for which reason most of them deteriorated. It was not until the middle of the 19th century that the Government appointed forest officials, trained in Europe. One of the first reforms introduced by them was to substitute a systematical clearing for the haphazard felling of the trees, which had been carried on until that time. After abolishing the forced labour of the natives in 1867, the wood cutting was leased to private individuals.

In 1880 Java was for the first time divided into forest districts, each of which at that time consisted of 25 — 30.000 H. A. Gradually the disadvantages of this extensive management and of wood cutting in lots by private individuals were more and more apparent. A new forest regulation, issued in 1897, therefore decreed that gradually all teak woods should be divided into tracts, or so-called forest sections of about 5.000 H. A., in which sections intensive management would be practised according to a detailed working plan.

The wood cutting in these districts is chiefly done by the Forestry Service. The forest regulation of 1913, which is still in force, made it possible also in those tracts, which were not divided into districts, to fell trees under their own management. Lack of a suitable staff, however, is the reason why the exploitation of these tracts is still leased to private individuals.

In 1894 a separate division was established in the Forestry Service, to which was assigned the forest organization proceedings.

A surveying brigade which has already constructed excellent maps of almost all the teak woods is connected with this division for the surveying and mapping of the forests.

The organization brigade occupies itself especially with the planning of working schemes for the forestry. When a new tract is opened up, a division network, conforming with the ground formation, is first constructed and the main transport roads are fixed. Then a detailed description of the forests takes place, which serves as a base for the working scheme, planned for the next ten years. In this scheme are included, among other things, worked out plans for felling, cultivating, thinning out, road building and house building. Every ten years the working system is revised, at which time an entirely new forest description is made. In this way it is assured that the forests are able to produce about the same amount of wood continuously, while care may be taken that only such forests are cut down, as are suitable for that purpose.

At the end of 1922 the teak woods had an area of about 735.000 H. A., of which 47% was organized into forests sections.

The cleared forest grounds which are not needed for extension of the lands for the population, are at once replanted.

In the course of time, various methods of re-afforestation were followed. At the present time the forest agricultural system is chiefly practised, which combines forestry and agriculture and allows the natives to interplant farming



GOING HOME FROM THE MARKET

crops between the rows of teak. For the purpose of obtaining sooner the desired covering of the ground, perennials are interplanted, in which case the varieties, improving the soil, are used by preference. Among these plants the kem=landingan (Leucaena glauca) takes the first place. In other ways also, attempts are being made to prevent the deterioration of the soil, whereby in the last few years, chiefly through the efforts of the forest experimental station, the planting of mixed crops has made great advancement.

After a period of from five to ten years the first thinning out of the trees takes place, which process must be repeated several times. The wood obtained in this way is particularly adapted for domestic building purposes, and is also used for various industries. The importance of the thinning is increasing every year. Already in 1920 23.200 cubic metres of wood obtained in this way was put on the market. Although the forests have been considered ready for felling after from 80 to 120 years, the researches of the experimental station have proved that the most desirable age at which a forest must be cut down is nearer 80 than 120 years.

The trees are cut by volontary labour of the natives. The trunks are then sawed into round or square timber, while the remainder is chopped into fire=wood. For transportation mono=rails are often used, the cars being pushed by hand. Some years ago, in an extensive forest tract in the Residency of Rem=bang, the Forestry Service built a system of tramways for which locomotive power is used. All the wood transported over these tracks is gathered up at a central lumber yard in Tjepu, where it is sold at public auction.

The export of teakwood naturally decreased considerably during the years of the war.

Following are some figures regarding the teakwood area.

YEAR	AREA OF TEAK FOREST IN H. A.			NEWLY PLANTED AREAS IN H. A. FOR EACH YEAR.
	FOREST DISTRICTS	FOREST SECTIONS	TOTAL	
1912	569.315	110.449	679.764	7.390
1913	548.559	137.631	686.190	6.951
1914	545.061	141.312	686.373	6.701
1915	557.769	155.705	713.474	6.501
1916	531.908	189.910	721.818	6.746
1917	510.271	217.127	727.398	7.123
1918	477.251	249.315	726.566	7.362
1919	466.209	269.073	735.282	7.228
1920	433.773	305.007	738.780	6.394
1921	406.562	326.423	732.985	6.432
1922	391.946	342.252	734.198	4.838

YEAR	PRODUCTION OF TEAK TIMBER IN M^3				PRODUCTION OF TEAK FIREWOOD IN METRE STACKS	EXPORT OF TEAK TIMBER IN M^3
	TOTAL	TIMBER FELLED				
		UNDER CONTROL OF FORESTRY SERVICE	BY CONTRACTORS	BY IRREGULAR EXPLOITATION		
1912	247.072	121.152	118.873	7.047	948.527	38.277
1913	269.946	144.678	117.877	7.391	1.176.971	34.971
1914	229.468	136.525	87.168	5.775	1.127.132	28.170
1915	172.719	86.627	80.918	5.174	894.202	17.002
1916	186.202	109.106	73.336	3.760	1.173.580	14.703
1917	261.176	183.678	74.278	3.220	1.531.393	50
1918	217.807	155.712	58.588	3.507	1.227.235	1.185
1919	188.483	137.058	48.300	3.125	955.429	9.300
1920	214.718	151.657	59.693	3.368	1.354.763	12.610
1921 *	254.700	188.500	63.200	3.000	1.457.500	1.043
1922 *	116.460	69.500	43.840	3.130	673.970	3.240

* The figures over 1921 and 1922 are not exact but roughly taken.

B. The wild timber forests of Java.

So great is the economic value of teak for Java that all other kinds of wood are classed as wild timber.

The number of these wild timber species in Java amounts to more than 1.200. With a few exceptions, such as Casuarina= and bamboo=forests in East Java, the wild timber forests are composed of a great variety of trees. Their composition varies considerably and depends on the climate and the altitude at which they are located. In general the forests vary less when located in a higher altitude. Knowledge regarding the practical value of the various kinds of wild timber is still very incomplete. Botanically, however, in contrast with those of the Outer Districts, they are very well known. This is chiefly due to Dr. S. H. Koorders, the forestry botanist, whose work forms a solid base for further technical and forest researches.

The great importance for Java of the wild timber forests at present is not so much the value of the wood, as the hydrologic influence which they possess.

In a country like Java, where the cultures are dependent to such a great extent on a regular water supply in the plains, the influence of the forests is of the greatest importance, since they prevent the water from flowing off too rapidly in the rainy season, while in the dry season the springs continue to provide water.

It is probable that the forests also exert an influence on the climate, but so far, this has not been scientifically proved.

It took considerable time before the great hydrologic value of the wild timber woods was realized. Forestry officials had been active for several years in the teak woods before any attention was paid to the latter. Only when the clearing of land began to be extended higher up the mountain slopes and at the same time the rice fields in the lowlands were continually increased, it was recognized that for the sake of the water supply part of the woods must be left uncleared.

In 1890 the first instructions were given out for a forest reserve. These instructions were very general and are being gradually replaced by more detailed directions.

The plans considered within the last few years for utilizing the available water power in Java on a big scale for the production of electricity, have still more emphasized the value of the hydrologic forest reserves.

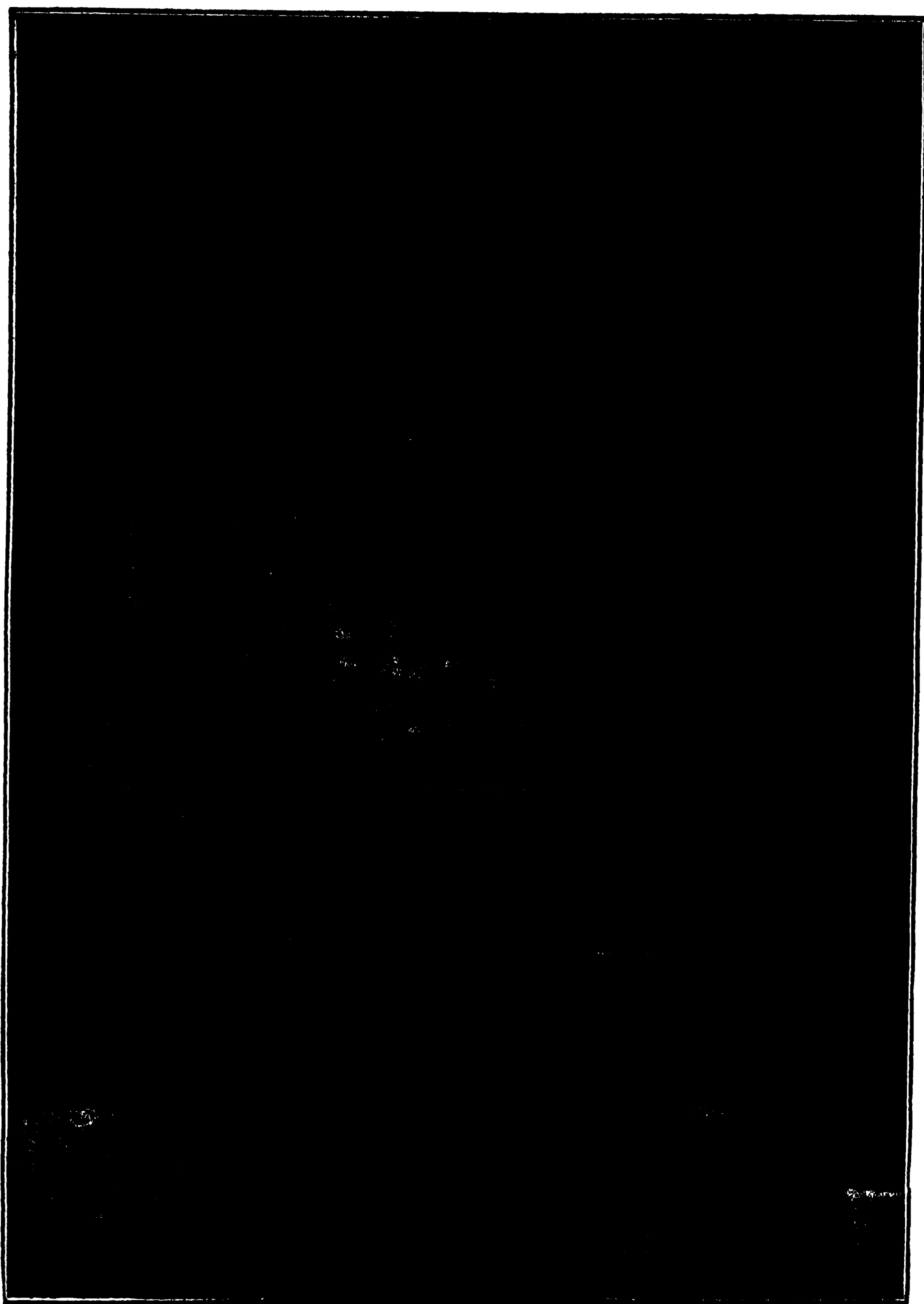
Of the total area of Java, which is 13.000.000 H. A., about 1.487.000 H.A. consisted of forest reserves at the end of 1922. In these reserves are also included the bare mountain slopes, the re-afforestation of which is thought necessary, while various forests belong to it, which, though of no use for hydrologic purposes, are reserved for the sake of the future wood supply.

The unreserved forests and the remaining waste lands are destined for the gradual extension of agriculture. At the end of 1922 the area of these amounted to about 700.000 H. A., according to a very average estimate. This area is being diminished every year through new clearings by the natives, as well as by the granting of long leases for big agricultural enterprises.

After the reserves have been specified, the grounds are marked out by boundaries which are fixed by means of durable signposts. This comprehensive work is not yet completed.

The reserved forests are protected as much as possible from damaging influences, while work is constantly being carried on for the afforestation of the bare mountain slopes within the reserves. In this respect East Java is less favourably situated than West Java, largely as a result of the climate, which, in the eastern part of the island, has a more pronounced dry season, so that destructive forest fires much sooner spring up. Furthermore, at the time when the reserves were planned, the clearing in East Java had already reached a greater height than those in West Java.

The surest means of re-afforestation is by artificial planting, at least, when this is done by experts. It is, however, very expensive and in view of the vast areas which are considered for replanting, would consume an enormous amount of money. It was soon attempted therefore, to reach the desired goal by promoting natural re-afforestation. It was evident that if the protected area could be guarded against fires and cattle, a new tree growth soon began to develop. Especially in West-Java, which is damp, very good results are obtained in this way. In East Java, during dry years such as 1918 and '19, it is very difficult to protect the extensive mountain slopes, covered with „alang-alang", (Indian reed-grass), which easily catches fire, and often a single fire will undo the



BURUBUDUR. RELIEF

result, which nature required many years to attain. Besides this care, attempts are also made to promote re-afforestation by the making of girdle cultivations and fire ditches, fences of barbed wire, etc.

When artificial afforestation is started, it is endeavoured to plant not only varieties of wood, which are important from a hydrologic point of view, but also those, which will later on be able to produce a superior timber.

As a result of the ever increasing need of wood in Java, more and more use is made of the wild timber. This wood is obtained partly by import from outside Java, the remainder being felled in Java itself. This exploitation is of special importance in West and East Java; in Central Java, where teak wood is easily obtainable, the turnover of wild timber is small.

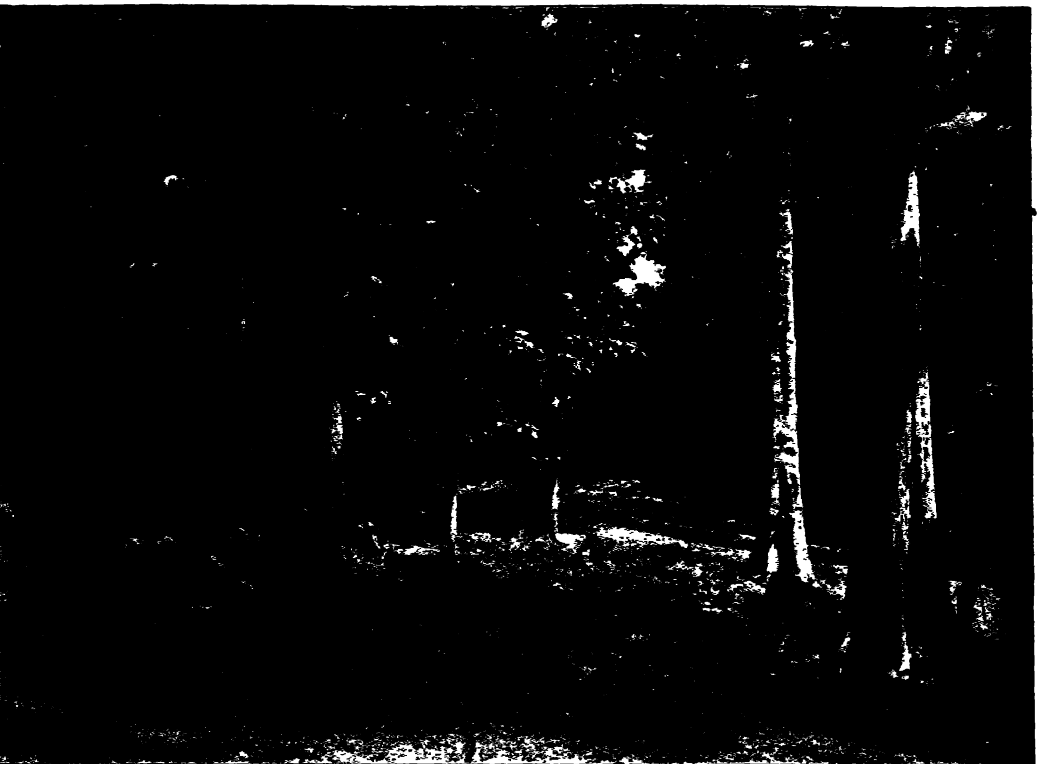
Part of the wood is cut by the consumers, on permit, the rest being felled under control of the Forestry Service. This felling is of special importance in Besuki and in the Preanger Regencies. In the latter residency the chief wood cut down is Rasamala (Altingia excelsa), which in West Java is generally used for building purposes. The exploitation is ordinarily carried out according to a felling system, in which re-afforestation is left for the greater part to nature. In the last few years, considerable areas of this variety were brought under cultivation.

In order to exploit the forests in such a way, that they may still serve as a protection, a detailed working plan was made up, by way of experiment, for a tract of 16.000 H. A., located in West Preanger, while for other tracts being favourably located for transport, similar plans are in course of preparation.

Following are some figures concerning the wild timber forests of Java.

YEAR	AREA OF WILD TIMBER FOREST TO BE RESERVED IN H. A.	PERCENTAGE OF THESE MARKED OFF AT END OF YEAR	TOTAL YIELD OF WILD TIMBER IN JAVA[1])		TIMBER FELLED BY FORESTRY SERVICE	
			TIMBER IN M	FIREWOOD IN METRE STACKS	M3	METRE STACKS
1912	998.400	37%	12.603	88.739	6.293	54.098
1913	1.024.700	43 ,,	13.307	66.436	7.230	56.934
1914	1.055.600	46 ,,	13.300	113.935	8.482	75.860
1915	1.196.200	51 ,,	24.561	94.393	18.977	70.137
1916	1.264.800	52 ,,	18.878	97.095	11.290	68.293
1917	1.271.600	56 ,,	18.229	147.616	10.496	100.873
1918	1.276.600	59 ,,	27.960	150.366	18.500	106.566
1919	1.397.000	59 ,,	22.005	184.740	10.893	109.442
1920	1.481.900	60 ,,	25.334	195.617	14.262	139.981
1921	1.470.890	60 ,,	31.000	143.300	15.200	113.000
1922	1.486.493	60 ,,	9.915	151.700	4.222	88.281

1) No account is taken here of timber cut on private estates and on estates which are being opened up on long-lease, because no data regarding these are available.



TEAK FOREST

Forest research.

Forest research is carried on at the Experimental Station of the Forestry Service, which was established in 1913. Beginning with a staff, consisting of a technical forestry director and a few assistants, the institution has developed very considerably in the past ten years. It is now divided into six divisions, whose task it is to make the following researches:

1. forest maintenance and produce examination,
2. problems in the field of teak re=juvenescence,
3. d° of the wild timber industry,
4. d° of the forest protection,
5. wood investigation,
6. botanical=technical forest exploration.

The forest maintenance and produce examination aim at creating a solid base for the forest industry, in wood production as well as in money. The first results of this very comprehensive research, for which a considerable number of experimental plantations have been constructed and surveyed, are published in "Communications I, II, III and IV of the Experimental Station of the Forestry Service".

Research of problems in the field of teak re=juvenescence includes the gathering of all forestal data on the teak and its principal companions i.e. those species of wild timber which come under consideration for planting along with the teak, or to replace it in certain tracts. In co=operation with the forest managers, a great number of experimental plantings were made during the past few years, in various parts of the teak wood area, while in some districts, where the problem of teak re=juvenescence presents special difficulties, measures are being taken to increase steadily experiments, by reserving land for cul=tivation and by constructing permanent nurseries. Besides studying the subject of nursery methods, growing conditions and the character of the different tree varieties, this division at Buitenzorg is occupied with the examination of various tree seeds, with seed distribution, etc.

The division of wild timber industry carries on the same researches as those mentioned above in connection with the teak forests. The species to be studied however are different, viz. those of the wild timber forests and those of the mountains and plains. Some of the most important problems, the solution of which is urgent, and upon which the attention of the institution is principally fixed, are the investigation of woods adapted for various industries, the question of a tanningbark supply and the felling industry in the mountain wild timber forests. For the needs of the first two experimental gardens are reserved in forest tracts, which are especially set apart for that purpose, and these already cover a considerably area.

In the field of protecting the forests against damage, pests and diseases, the Forestry Experimental Station studies the damage done by fire, grazing cattle, wind and water, and protection against these, the consequences

of insufficient care of the soil and preventative measures against them, the influence of proper continuous protection of devastated and bare tracts, etc. The research of pests and diseases, as far as this lies in the field of entomology and mycology, is now assigned to the Institute of Plant Diseases. Researches of various forest damages are conducted by the Forest Experimental Station, the results of which are published in Communication IV of the Experimental Station for the Forestry Service. The Experimental Station also carries on a vigorous research into the character of the vast number of wood species found in the Dutch East Indies, for which purpose the institution has the necessary apparatus and accessories at its disposal and which is of very great importance in view of the rapidly developing wild timber exploitation especially in the Outer Districts. To comply as well with the daily incoming requests for information and with the demands of the trade, to have as soon as possible the disposal of mono=graphs, charts, classifications for practical use and instructions for the working and preserving of timber, the division in charge of this research must be considerably extended. Plans for this are under consideration.



AUTOGRAPHIC WATER STAGE REGISTER

This division — especially in view of the practical interest of the timber=trade — published communication No. 5 and No. 7: "On the identification of Indian wood=species from experience, with simple aids and appliances".

The botanical=technical forest exploration in the Outer Districts has the task of determining the native, commercial and scientific names of the principal wood species, the gathering of authentic material on this subject, the compiling of data regarding their practical utility and durability, together with the determining of their value, while in co=öperation with the division for forest research, monographs, charts, etc., must be composed. The research in the first place is confined to those areas which are considered for forest exploita=tion. For the present it is limited to some forest tracts in the Residency of Palembang; in the near future the division will also have to conduct the explorations in other regions.

C. Forestry in the Outer Districts.

In the Outer Districts vast tracts of forest are still found. Some of these

consist of a large variety of trees, while in others one or a few species predominate. Thus in South-East Borneo forests are found consisting of over 50% real ironwood (Eusideroxylon Zwageri T et B) and some Dipterocarpaceae, while in South Sumatra, at least 7.000 H. A. are found consisting almost entirely of ironwood forests. In other places are forests, consisting of more than 80% camphor trees (Dryobalanops Gaertn.) (Singkel in Acheen) or where two or three species of Dipterocarpaceae form 60% of the total (for instance, on the island of Simalur). In Muna about 20.000 H. A. of teak forest, are found, for the most part very devastated. The possibility of forest exploitation is of course much increased by the predominance of a few good varieties of wood.

The forests in the areas under direct control belong to the Government, those in the remainder of the self-governing communities belong to the various communities. Some of these have given the administration of their forests in charge of the Government, others manage it themselves, under supervision of Government assistant conservator of forests.

At present the Outer Districts are divided into 2 Inspection Divisions. The joint staff included ulto. 1923: 2 Inspectors, 21 conservators and assistant conservators of forests as well as the subordinate staff.

Sumatra is divided into 5 service districts, while South-East Borneo and the island of Celebes each form one service district.

The proceedings are chiefly confined to researches regarding the location, composition and condition of the forests. For assistance along these lines, a surveying brigade was organized at the end of 1917, which at the beginning of 1923 consisted of 1 Chief, 7 chief surveyors and further staff.

In some regions, viz. the Residencies Sumatra's Westcoast, Tapanuli and Benkulen, the proceedings mentioned above have already led to the establishment of forest reserves, while furthermore the regulation of existing exploitations has been taken in hand and the establishing of new private enterprises promoted.

For the residencies Sumatra's East Coast, the Lampongs and Palembang, a rough estimate has been made of the forests which are to be reserved, either for reasons of a hydrologic nature or in connection with the future wood supply.

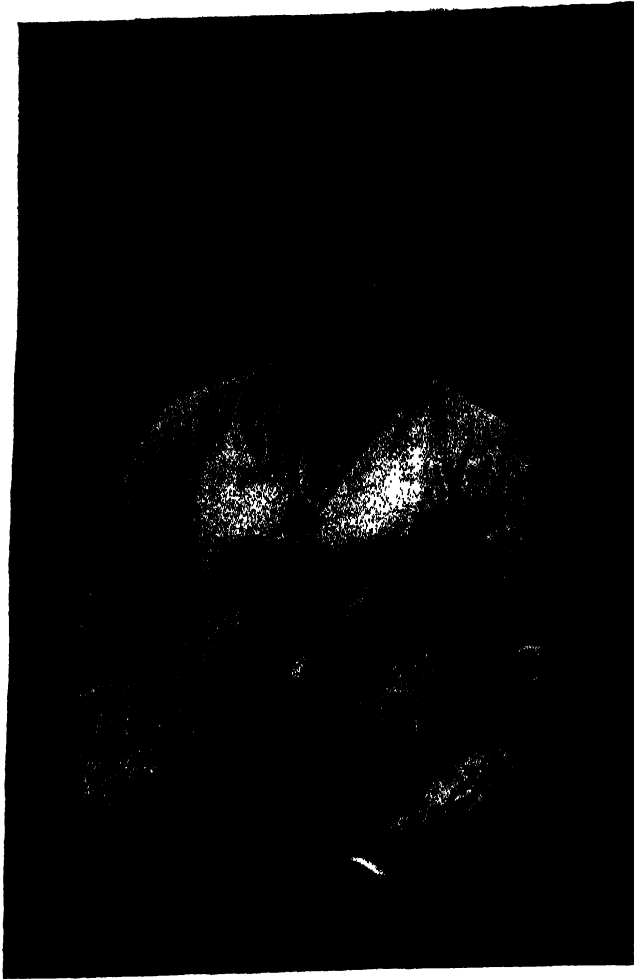
The granting of forests on long lease to private enterprises (the so-called, forest concession) is regulated by the Government Decree of August 27, 1904, No. 35 ("bijblad" 6075). In accordance with this decree forest areas to a maximum of 5.000 bahoes (± 3.550 H. A.) may be given in concession for 30 years, against payment of a fixed yearly duty per bahoe and a tax per exploited unit of wood.

The concession may be withdrawn, if the exploitation is not started within a year after acceptance (Government Decree of January 22, 1914, No. 48, „bijblad" 8025).

Besides these grants on long terms, there is also the concession for felling on short term, which is generally granted by the officers of the Civil Service.

For the provinces Palembang, the Lampongs and the sub-division Singkel of Acheen, so-called forest protection ordinances were introduced in which, among other things, the concession on short term is regulated in detail. Formerly a similar regulation existed in Billiton.

The greatest quantity of wood, exploited in the Outer Districts, is now always supplied by the felling on short term, those of the population in South-East Borneo and Palembang and the Chinese panglong exploitation in Bengkalis and Riouw being of special importance. Only in recent years felling on concession has begun to develop to a greater extent. The island of Simalur, on the northwest coast of Sumatra, furnishes the first example of a modernly equipped wholesale industry. This exploitation is carried on by the United Indian Forest Felling Companies. In South-East Borneo exploitations on a small scale are conducted by various owners of concessions, under own management.



TEA PICKSTER IN THE PREANGER REGENCIES

A considerable part of the wood, exported from the Outer Districts, is used in Java. Singapore also is an important wood market, where, among others, an average amount of 250.000 M^3., which is yearly felled in Bengkalis and Riouw, is sold by auction.

As increasing markets, China (Hongkong and Shanghai), Japan and Australia may also be mentioned.

A large part of the exported timber is supplied by the species belonging to the Dipterocarpaceae.

To this species f.i. belong:

Campherwood (Dryobalanops aromatica, Gaertn), found especially in Tapanuli; further on the N. E. Coast of Sumatra and W. Borneo.

Mengrawan (Hopea mengrawan Miq.); found in Palembang and in the Lampongs.

Meranti: (Hopea meranti Miq.) found in Banka, Palembang, Lampongs, Indragiri, Siak Sri Indrapura, Borneo, Sumatra's West Coast.

Bangkirai. (Hopea spec.) found in Borneo.

Resak. (Shorea spec.) found in Simalur, South-East Borneo, Banka and Billiton.

The species Laureceae supplies the real Borneo ironwood (Eusideroxylon Zwageri) found in South Sumatra, Pulu Laut, Borneo, Banka and Billiton.

As building material we should mention *Merbau* (Afzelia spec. fam: Leguminosae) found in Palembang, Borneo and N. E. Sumatra.

In Acheen and the Battaklands vast forest of *Pinus Merkusii* are found which produce much turpentine.

Kajoe-lara (Metrosideros spec.) and *Kolaka* (Parinarium spec.), with a great chance of security against pile-worm, found in Celebes.

Rhizophora spec. and *Bruguiera spec.* The bark is suitable for tanning purposes and cutchmanufacture; vast areas are found in Palembang, Indragiri, Siak Sri Indrapura, E. Coast of Sumatra, W. en S. E. Borneo.

Besides the export of ordinary timber, we shoud also mention Menadonese ebony (Diospyros sp.) found especially in: Minahasa, Middle Celebes and the Moluccas.

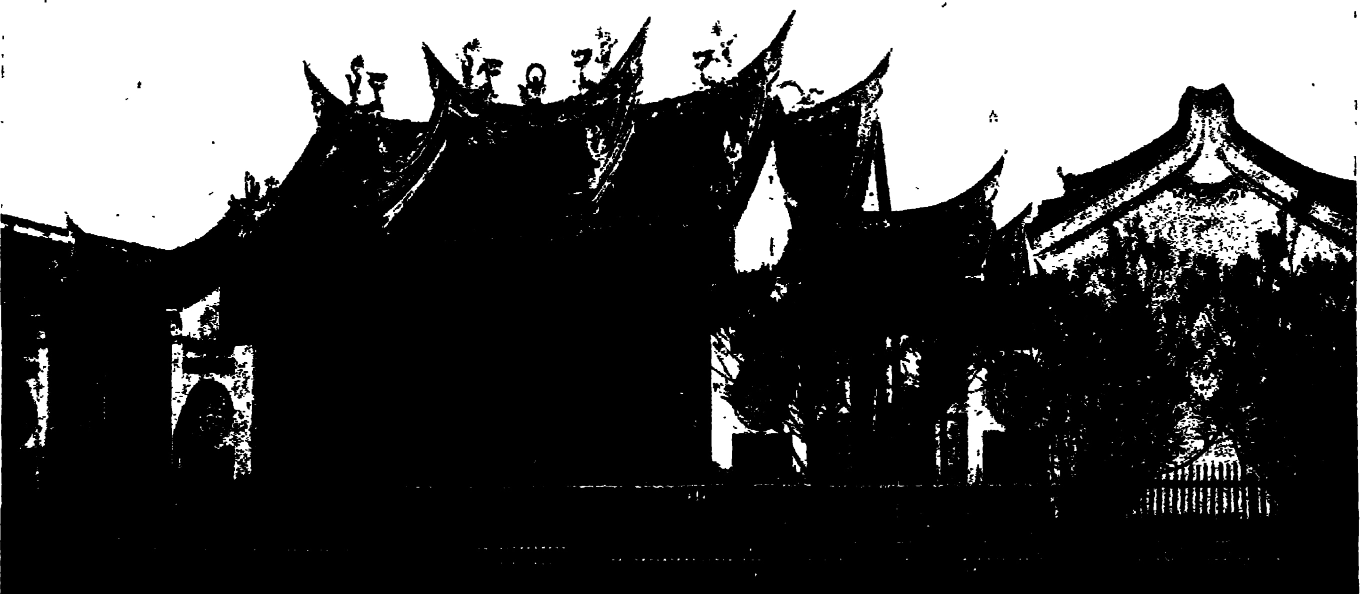
Sandalwood (Santalum album L.) found in Timor and neighbouring islands and speckled wood (Pterocarpus indicus Willd) found in the whole Malay Archipelago especially the Moluccas and Celebes.

Apart from the point of view of wood supply, the forests in the Outer Districts are of great importance on account of the vast quantities of by-products which they produce. These products are gathered by the native population and sold to buyers. The most important of these are: rattan, damar, copal, gutta percha and other kinds of gum, tanbark, etc.

Staff and Financial Results.

The following comparison between the number of the staff at the end of 1910 and that at the end of 1922 gives an idea of the considerable advancement which the Forestry Service has made in recent years.

From the records of the financial results of the last few years, finally, the importance of this service from a financial point of view may be seen.



EXTERIOR OF A CHINESE TEMPLE

Number of officials and functionaries in service at the end of the year:

	1910	1922
Chief inspector	1	1
Inspectors and Director of experimental station	5	9
Conservators and assistant conservators	84	138
Wood=architects and apprentice wood=architects	—	35
Chief overseers, overseers and student overseers	155	429
Native rangers and forest=guards	692	1690

FINANCIAL RESULTS OF THE FORESTRY INDUSTRY:

YEAR	FORESTRY SERVICE IN: JAVA AND MADURA	FORESTRY SERVICE IN: OUTER DISTRICTS	EXPERIMENTAL STATION	BALANCE
1912	+ glds. 3.029.674	+ glds. 69.990	glds. —.—	+ glds. 3.099.664
1913	+ „ 2.968.394	+ „ 126.092	— „ 42.698	+ „ 3.051.788
1914	+ „ 2.137.004	+ „ 75.328	— „ 44.506	+ „ 2.167.826
1915	+ „ 2.328.811	+ „ 23.489	— „ 57.382	+ „ 2.294.918
1916	+ „ 2.990.449	— „ 14.550	— „ 78.004	+ „ 2.897.895
1917	+ „ 6.029.317	— „ 100.372	— „ 88.493	+ „ 5.840.452
1918	+ „ 4.884.180	— „ 137.254	— „ 115.910	+ „ 4.631.016
1919	+ „ 4.323.652	— „ 230.000	— „ 139.669	+ „ 3.953.983
1920	+ „ 8.811.206	— „ 439.192	— „ 225.781	+ „ 8.146.233
1921[1])	+ „ 7.052.000	— „ 490.000	— „ 197.200	+ „ 6.364.800
1922[1])	+ „ 2.048.000	— „ 500.000	— „ 218.000	+ „ 1.330.000

1) Preliminary figures.



VETERINARY SERVICE.

Civil veterinary service.

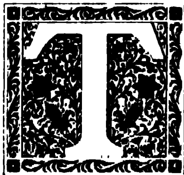
The laboratory for veterinary research.

The veterinary school.



CHAPTER VIII

CIVIL VETERINARY SERVICE.



his branch of service is under the general leadership of the Director of Agriculture, Industry and Commerce and was founded to prevent and to fight contagious stock diseases and to devise means to improve the horse and cattle stocks of the natives.

For that purpose there are one or more European veterinary surgeons in the different provinces of the Dutch East Indies. The number of veterinary surgeons is in proportion to the extent and importance of the stock in these districts. These officers are assisted by native veterinary surgeons trained in Java and by a considerable number of native cattle „mantries", or foremen.

These veterinary surgeons are placed under the technical control of four Inspectors, one in Sumatra, two in Java and one for the other islands of the Archipelago, while the daily management is entrusted to the chief of the Civil Veterinary Service at Buitenzorg, the headquarters of the Department cf Agriculture, Industry and Commerce.

All treatments against contagious diseases, such as preventive and curative inoculations and serum injections, are free of charge, as the population, consisting chiefly of small cattle owners, is not in the condition to meet the expenses.

The serums used are prepared and controlled by the veterinary laboratory at Buitenzorg.

The most common and consequential contagious diseases are:

Anthrax, Blackleg, Septichaemia epizoötica, Aphtae epizoötica, Malleus (Glanders), Saccharomycosis, Surra, Piroplasmosis and Tuberculosis.



LAKE SITOE BAGENDIT

The Dutch and Australian cattle, and the cattle crossed with these, are the only ones affected by the latter disease; the native cattle and buffaloes are practically free from it.

In spite of these more or less prevailing contagious diseases, the general health of the native stocks can be put down as favourable.

In order to prevent contagious diseases coming into the country from abroad, principally Rinderpest, Hogcholera (Pestus suüm), Anthrax, Pleuro-pneumonia and Tuberculosis, the import of pigs from abroad is prohibited, also the import of ruminants from Asia and Africa and of cattle from Queensland, New South Wales and Victoria of the Australian Commonwealth. It is also prohibited to import hair, wool, hides, horns and dried meat from Africa, Asia and Australia, and fresh meat, hay and straw for cattle fodder from Africa and Asia.

The import of cattle originating from the parts of Australia, not belonging to the States of Queensland, New South Wales and Victoria, is only allowed under special stipulations as far as the cattle is destined for the slaughterhouse.

In special cases, however, the Director of Agriculture, Industry and Commerce can give a license to import the above mentioned animals under conditions, ordered by him.

With regard to the stock-traffic between the different harbours in the Archipelago, there are also prohibitive and restrictive ordinances for the import and export of cattle. These orders are partly to safeguard the stocks against the import of contagious diseases and partly — by the export prohibition — to safeguard the stocks against an excessive export of breeding material, and by the import prohibition, it prevents the pure stocks from becoming crossed with other breeds and kinds.

The stock of cattle at the end of 1921 in round figures amounted to:

	HORSES	CATTLE	BUFFALOES	PIGS	GOATS	SHEEP
JAVA AND MADURA	273.000	2.986.000	2.074.000	97.000	1.421.000	842.000
OTHER ISLANDS	429.000	805.000	1.069.000	805.000	533.000	113.000
TOTAL	702.000	3.791.000	3.143.000	902.000	1.954.000	955.000

The native horses in the Dutch East Indies are ponies, mostly only of 1.13 M. to 1.24 M. height. The sandelwood horses (from Sumba Island) and the Batak horses (from Sumatra) belong to the better breed of horse. Sumbawa also turns out an excellent, although rather small, cart horse, which is used quite a lot for public transportation in the big cities of Java. With its moderate temperament and great endurance (which it shares with all native horses) it is better for that kind of work than the more fiery Sandelwood and



ALIN MP



NATIVE HARBOUR

Batak horses. The latter, which are mostly in the hands of private people, are used for driving and riding.

The army is mounted on Australian horses and only uses the native horse for the Transport and the Machine Gun Corps.

At the public auctions in Java the prices paid for the unbroken small horses from the Sundanese Islands range from glds. 100.— to glds. 300.— the average price being glds. 155.—.

Owing to the late extension of European cultures, and especially in Java, there has risen a great demand for transport horses. The result was, that these islands exported more of the better class horses than was really good for the half wild stud=farms there.

The Government had to intervene and issued several orders to prohibit the export of mares and of the stallions considered necessary for the breeding. By prohibiting the import of mares and stallions it is being attempted to keep the stock on the islands pure and to let it improve itself by interbreeding, if possible.

By stationing pure Sandelwood stallions in Java (Preanger Regencies) and on the West Coast of Sumatra, the Government is endeavouring to improve the breed of the native horse there by crossbreeding.

The total export of horses from the Small Sunda Islands during the years 1919/1921 on an average amounted upwards of 15.000. At glds. 155.— each, this export was worth glds. 2.325.000.—.

The native horses are practically not exported to foreign countries.

Horses are only imported from Australia, direct or via Singapore. How=ever this import is very insignificant since the motor car has taken the place of the luxury horse. In 1921 only 60 Australian horses were imported — not counting Army horses — and they were principally race horses.



ROAD IN SOUTH JAVA

The native cattle is considered a descendant of the banteng (Bos Sun-daïcus). It is an even coloured (brown in several shades) and small cow, measuring 1.10 M. to 1.30 M. and with a dead weight from 100 K. G. to 120 K. G. The breeding is done exclusively for draught animals (transportation and sawah tilling) and for slaughtering.

Of the different kinds of this cattle the best are found in Bali and Madura. The cattle on the last mentioned islands differs very little from the Javanese cattle, but on the whole is heavier. There is also good cattle in Sumatra (Acheen and the Padang Highlands); however this again is somewhat smaller than the Javanese kind. As the increasing demand for draught cattle in Java (in connection with the growing European cultivations, especially sugar) was threatening the stock of cattle there, attempts were made in this island to get a heavier working animal by crossing with the British Indian breeds.



TOWN-GATE IN THE INTERIOR OF JAVA

The result of a number of experiments with several British Indian breeds (Guyrat, Mysore, Ongole and Hissar) is that now there is a stock of 3.000 heads of pure Ongole cattle in the island of Sumba, which are lent out in herds of 1 bull and 12 cows to the population there.

So as to slowly acclimatize the Sumbanese bred Ongole stock, when it comes to Java, when desirable and possible, it is taken over by the State Stock Farm at Pengarasan (Pekalongan Residency) for further rearing before being handed over to the population.

At Sumbawa, Hissar cattle is given out in herds. The bulls bred from these are mostly used to cross with the native cow in Sumatra.

In this way the Dutch East Indies have become independent of getting Bengalese cattle from British India for crossing with the native cattle. It became more and more difficult to get good breeding cattle from there.

As the native cow does not belong to the milk giving breed, foreign cattle, Australian and Dutch (Frisian), is imported to supply the European centres. These cattle are partly interbred and partly crossed.

In order to keep the native stock of cattle pure and to safeguard it against an excessive export of good breeding species, and also against contagious diseases, a number of import and export regulations have been issued for the



HINDU TEMPLES IN CENTRAL JAVA

smaller islands, similar to those in connection with the horses in the small Sunda Islands. The effect of these regulations is supported by another, which prohibits the slaughter of female cattle fit for breeding and it also encourages the castration of the male species, not fit therefore. This castration is done free of charge and is very popular in many districts.

Lastly, retaining bounties are granted on a limited scale to good male breeding species.

The import of Australian cattle (not counting that for the shambles) amounted to 367 in 1922, while only 14 were imported from Holland. At the present time the Dutch cattle is too expensive and cannot compete with the Australian cattle.

Nevertheless, there is a limited chance for the milk farms to improve their stock of milk cows with Dutch bullocks. The milk farm „Generaal de Wet" at Tjisarua near Bandung, has a pure Frisian stock of cattle. The bullocks, considered suitable for breeding, are taken over for glds. 400.— each by the Government and are supplied to the dairy farms at the same price. There were 34 of these in 1922.

There is not much Governmental interference with the buffalo stock. They are exclusively kept for sawahwork and for slaughter.

Except for the issue of a few regulations, limiting the export, it does not go any further than encouraging the castration of the inferior male species and the prohibition of killing the female species fit for breeding.

The consequent rise in the prices made it possible to import Australian oxen and frozen meat at good profits. In 1922 the number of oxen imported in Batavia alone, amounted to no less than 6.354. The import of meat in Batavia amounts to about 45 tons per month.

The export of cattle from the Dutch East Indies is of no importance, except of 45.000 pigs to Singapore. The island of Bali is the centre of that export. The people there are not Mohammedans and do a big business in pig breeding. In 1922 there were 91.000 pigs exported from that island.

THE LABORATORY FOR VETERINARY RESEARCH.

The laboratory for veterinary research was established in 1908.

The object one had in view at the time of the foundation, consisted in brief of carrying out diagnostic researches for practical purposes, as well as the study of the contagious cattle diseases and the methods to fight these.

In the beginning the work could only be done on a small scale as the original staff was limited, but gradually it could be extended.

A start was made with the preparation of sera, vaccines and diagnostica, which were already known and could be applied in the Dutch East Indies. Thus in the course of years the problem of the glanders of the horse and the tuberculosis of cattle has been taken in hand and methods searched and worked out for the application of the usual diagnostica in relation with these



FISH-POND IN THE PREANGER REGENCIES

diseases: malleine and tuberculine; also for the serological diagnosis of glanders (agglutination and complement fixation test); further more a research was made as to the value of the glanders vaccinations; in 1910 the dreaded contagious pleuro-pneumonia was introduced with imported cattle from Australia (by a timely stamping out of the source of the disease, the Java-stock could be saved from disaster); methods were tried and applied successfully, for an active and passive immunization against the in the Dutch East Indies so largely spread haemorrhagic septicaemia amongst buffaloes; parasitic blood diseases were studied with regard to their carriers (tabanidae with surra, ticks with piroplasmosis), as well as to their direct begetters (Trypanosoma equiperdum of the dourine, trypanosoma evansi of the surra, pirosoma bigeminum, anaplasma marginale, spirochaeta theileri etc.) and finally researches have been made for various other diseases such as: lymphangioitis farciminosa bovis, osteo-malacia, oestrosis in goats, osteo-myelitis bubalorum, septicaemia suum, pestis suum, abortus enzoöticus boum, infectious paraplegia in horses, saccharomycosis, hyphomycosis destruens equi, etc., etc. Besides these, all attention is paid to the preparation and supplying of various controlled sera and vaccines, such as serum and vaccine against buffalo septicaemia, serum and vaccine against anthrax, serum and vaccine against blackleg, serum against fowl cholera.

As an example of the size of the latter work, it should serve that in 1922 the following quantities were supplied:

Malleine	± 40.000	doses
Tuberculine A (for subcutaneous application)	± 2.000	„
Tuberculine B (for the eye test)	± 16.000	„
Septicaemia serum	± 20.000	„
Septicaemia vaccin	± 50.000	„
Anthrax serum	± 7.500	„
Anthrax spores vaccin	± 4.000	„
Blackleg serum	± 8.000	„
Blackleg vaccin (according to Leclainche Vallée)	± 8.000	„
Blackleg filtrate	± 5.800	„
Fowl cholera serum	± 500	„

The researches were successively published in a series of communications, which all appeared in the „N. I. Bladen voor Diergeneeskunde en Dierenteelt" (Netherlands Indian papers on veterinary science and animal husbandry).

THE VETERINARY SCHOOL.

This is a secondary school, where young men of every nationality are prepared for Indian veterinary surgeon.

For admission to the school a diploma from the Mulo school or an institution of similar rank is wanted. The course takes four years.



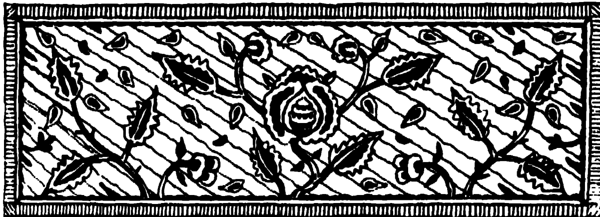
NEAR THE COAST

The examination for Indian Veterinary Surgeon includes the following Courses:

1. General pathology and pathologic anatomy of domestic animals;
2. Special pathology and therapeutics of domestic animals;
3. Surgical anatomy;
4. Surgery, including hoof diseases and ocular surgery;
5. The study of operations and dressings;
6. General and special pharmacology and science of poisons;
7. Obstetrics;
8. Veterinary surgical clinic;
9. Pharmacy;
10. Parasitic and contagious diseases;
11. Commissioned veterinary surgery and veterinary police;
12. Cattlebreeding (general and particular knowledge of fodder);
13. Milk and meat hygiene;
14. Rural economy.

The pupils, who agree to serve the Country as Assistant Government Veterinary Officers, at least five years after graduation, get a scholarship during their studies.

Attached to the school is a clinic for the purpose of clinical instruction.



MINING.

General.

Tin mining by the Government.

Private tin mines.

Coal.

Gold mining

Private gold mining and other minerals.

Petroleum.



CHAPTER IX.

MINING.



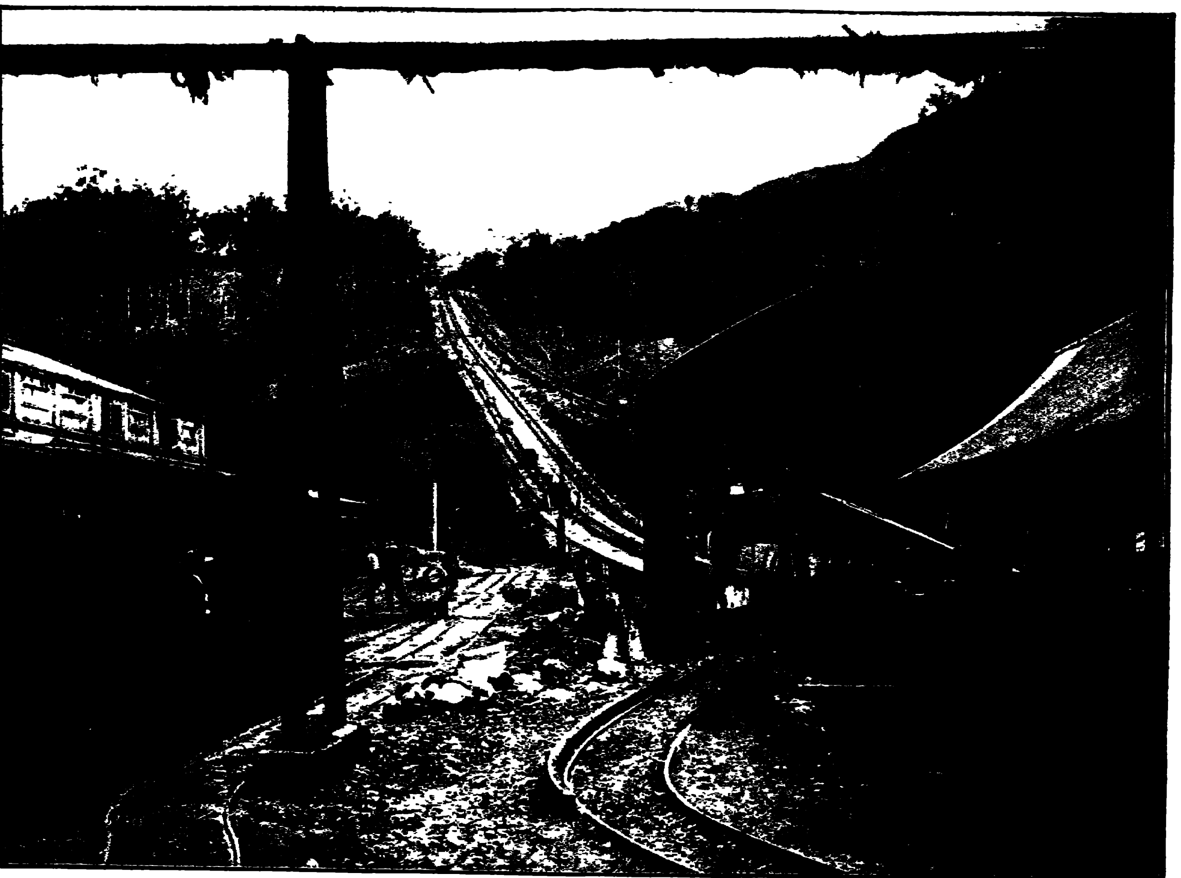
he jurisdiction of the Bureau of Mines extends over the following activities, i.e., geological surveying, vulcanology, prospecting for useful minerals, carrying on researches of mineralogical and metallurgical nature, locating and sinking wells for drinking water in deep layers, organizing and managing State mining industries and exercising regular legal supervision of private mining enterprises.

The Government mining industry includes the collieries at Sawah Luntoh, at Tandjong (Sumatra) and at Pulu Laut, an island off the south-east coast of Borneo, further the tin mines on the island of Banka and the gold and silver mines in Benkulen (Sumatra).

Private concerns, wishing to exploit minerals, must obtain a license to prospect and a concession; both these are subject to certain conditions regarding domicile of the owners during the concession period, Government taxes, security, transfer and Government supervision, set forth in the Mining Act of 1898, as revised in 1910 and again in 1919.

According to this latest revision, aside from rights already granted, no more concessions will be granted to private individuals for the so-called: b minerals (i.e. anthracite and all kinds of bituminous coal and lignites, petroleum, asphalt and all other kinds of bituminous substances, solid as well as liquid, and inflammable gasses, the latter as far as they are not of recent origin (marsh gasses) among which also iodine and allied substances are ranged).

The minerals named before, may henceforth be exploited only by the State itself, or by private parties in possession of an exploitation agreement with the Government, on the basis of article 5a of the Dutch East Indies Mining



CABLE TRACK AT ENTRANCE OF SCREENING HOUSE SAWAH LUNTO

Act, which agreement may only be signed by power of attorney fixed by law.

Concessions for the remaining minerals are still granted on the old basis. The working of minerals not mentioned in the Mining Act, is also subject to a permit.

Connected with the head office of the mining service in Batavia is the mineralogical and geological museum of the East Indian Archipelago, to which anyone, interested in the work, may obtain admission on application. At the same office, assays of minerals and ores are made for private persons.

TIN MINING BY THE GOVERNMENT.

The Government tin mines, all of which are situated on the island of Banka, are the outcome of an agreement made for the supply of tin by the former East Indian Company with the Rajas of Palembang, who, in those days, owned the island.

The mining, which probably dates from 1710, was first carried on by the Malay population. Soon, however, the Chinese took the industry in hand; in 1820 it was placed under European control by the Dutch East Indian Government and since 1852 has been supervised by mining engineers, trained in Europe. Originally these engineers were entrusted only with the topographical, geological and mineralogical survey of the island, but they have since been put in charge of the actual mining and smelting operations. They have introduced important improvements in the construction of smelting furnaces, the drainage of the open cuts and the stripping of the overburden, so that the tin industry at Banka is now entirely up to date and is making use of the latest technical inventions. Moreover during the past few years the tin has been subject to a chemical test, before being exported, so that the Banka stamp guarantees the quality of the product. Banka tin is exceedingly pure, containing 99.9% tin and more, the balance being chiefly iron.

The island has an area of 12.240 square K. M. and extends over a length of 100 nautical miles. Most of the mines are situated on the north-east side of the island.

The ore, which is found in the alluvial deposits of many riverbeds and in the alluvial strata on the slopes of small hills, is worked exclusively in open cuts. The deposits of some riverbeds extend for considerable distance into the sea, and accordingly some workings extend beyond the coast; this kind of exploitation is one of the interesting problems for the future.

The strata, so-called „Kaksa", from which the ore is obtained, are from 0.1 — 0.4 M. thick, although in exceptional cases this thickness reaches several metres.

The overburden ranging from about 5 to 20 metres, is chiefly removed by hand with the aid of mechanical or hydraulic transport (sluicing), the



BOW=NETS ALONG THE RIVER

latter being considered best fit for soft layers. This sluicing is supported by gravel pumps, partly of own design, about 200 of which were in regular service in 1922, 66.87% of the excavated ground being handled in that way.

A steam turbine driven electric power plant of 6.000 kw. is installed for distributing power to the most important districts.

The ore is first washed in sluices and is then generally smelted in simple blast furnaces called „Vlaanderen oven". Each district has a central smelting-house for all the mines.

The manual labour is still done by Chinese coolies and is partly contracted for and partly carried out under the Government's own management.

In 1922, 13.5% of the world's tin production was obtained under Government supervision.

The average number of labourers (contract coolies) in 1922, amounted to 18.061.

At present there are nine hospitals.

Since 1914 Banka tin has been sold almost exclusively in the Dutch East Indies. The tin is sold by private contract in Batavia, while a small part is supplied to various branches of service in Holland and the Dutch East Indies.

The following table gives some figures regarding the tin industry in Banka.

YEAR	NUMBER OF MINES	AVERAGE NUMBER OF LABOURERS	PRODUCTION IN TONS OF 1000 KG.	QUANTITY OF TIN MARKETED IN HOLLAND IN 1000 KG.	QUANTITY OF TIN SOLD IN D. E. I. IN 1000 KG.	COST PRICE OF THE MARKETED TIN PER PICUL IN GLDS 1)	AVERAGE SELLING PRICE IN GLDS. IN HOLL.	AVERAGE SELLING PRICE IN GLDS. IN D. E. I.	NETT RECEIPTS OF THE MARKETED TIN IN GLDS	NETT PROFITS OF THE INDUSTRY IN GLDS.
1919	311	18.129	12.404	904	15.254	63.01	182	176	46.227.847	29.682.893
1920	320	19.718	13.590	12	9.489	83.27	194	194	29.925.717	17.114.672
1921	324	19.254	15.142	—	13.971	93.—	—	113	25.685.458	3.308.602
1922	336	18.061	17.073	—	—.—	—.—	—	—	—.—	—.—

1) Freight and selling costs included.

PRIVATE TIN MINES.

The chief private enterprise is that of the „Billiton Maatschappij", which works the tin in the island of Billiton.

In 1852 a concession was granted to the Billiton Maatschappij, and in 1892 was extended for a further period of thirty-five years. In the new agreement it is stipulated, that five-eighths of the yearly profits goes to the Government.



THE CLUB AT WELTEVREDEN (BATAVIA)

The geological formation and deposits of the ore are almost similar to those in Banka. In Billiton however are also found ore=veins, which are rich enough to be worked, in eluvial deposits.

As in Banka, the work is done by Chinese „kongsies", working under contract, while the industry is organised along the same lines. Besides the regular manual labour and thereby appertaining mechanical appliances, also four suction dredges and one bucket dredge are in regular service. About $^{2}/_{3}$ of the tin is mined by hydro=mechanical means. An electric power plant, driven by Diesel engines, generates the necessary power. In 1921 twenty six mines were in exploitation.

As the date of expiration of the concession is approaching, a proposition has been made for passing a law entailing further exploitation of these tin mines for joint account with the Government.

Another private enterprise is the „Singkep Tin Company", to which a concession was granted in 1889 on the island of that name in the Riouw Archipelago.

The deposit of the ore is similar to that in Banka and Billiton and the mines are worked according to almost the same system. In the hills the ore is also mined by tunnels.

Near Singkep tin ore is also found at the bottom of the sea, where it is worked by means of bucket dredges. The Singkep ore is smelted in Singapore.

The following are some statistics regarding both these companies.

YEAR OF REPORT	BILLITON COMPANY		SINGKEP COMPANY
	PRODUCTION IN TONS (1000 K.G.)	SHARE OF PROFITS PAID TO THE D. E. I. GOVERNMENT IN GLDS.	PRODUCTION IN TONS (1000 K.G.)
1919	7.835	4.599.829	729
1920	7.677	2.560.577	618
1921	11.533	nihil	719
1922	10.793	data not available	672

COAL.

There are now three Government enterprises: the Ombilin mines, the mine at Pulu Laut and the Bukit=Asem mines.

Ombilin mines. The Ombilin mines are situated near Sawah Lunto in the Padang Highlands, a region very famous for its beautiful scenery. Mining was started in 1892.

For transport a railway, 156 K.M. in length, was constructed. Owing to the hilly nature of the country, parts of the track are constructed as rackrail.

The coal field extends for 10 K.M. in length and has a width of 9 K.M. The thickness of the seams varies, but is usually very great, some seams being partly as much as 12 M.

The coal in sight is estimated at ± 200.000.000 metric tons, of which a total of 7.291.425 tons was excavated from 1892 to 1919.

The coal burns easily with a large, clear flame and only small quantities of ash.

The mines so far have been worked entirely by means of tunnels with the aid of all kinds of modern technical machinery.

Formerly the greater part of the production was sold to private buyers (in 1913 80%, in 1914 76% of the total output), but during the years of war, on account of the stagnation of foreign shipping, the Government Public Services were supplied to a greater extent; in 1916: 28%; in 1917: 47.5%; in 1918: 48.62%; in 1922: 53.90%.

The coal, sold to private buyers is partly taken in at Emmahaven (Padang) as bunker coal, partly shipped as freight coal to Tandjong Priok, Sourabaya and Macassar, where it is reshipped as bunkercoal.

In order to supply the wants of coal in the Archipelago during the years of war, the production was raised as high as possible and as far as available means allowed.



VOLCANO IN JAVA

The labourers consist for the greater part out of convicts and Javanese contract coolies, the rest being made up out of local labour.

At the end of 1922 the total number of labourers amounted to 9.396, among which 4.822 convicts.

On account of the continuous changing of these latter, the output per capita is very low.

The hygienic conditions are generally favourable among the labourers; the mortality resulting from siekness amounted to 1.4 % among the Javanese contract labourers and 2 % among the convicts.

The death rate resulting from accidents amounted to a total of $2.65\,^{0}/_{00}$ in 1914, against $1.59\,^{0}/_{00}$ in 1917, $0.74\,^{0}/_{00}$ in 1918 and $1.09\,^{0}/_{00}$ in 1922.

An electric power plant provides the necessary power for the pumping machinery, underground transport by electric trolley locomotives, screening house, etc.

Exploitation is carried on stopes, combined with hydraulic stowage.

The following are some figures relating to the Government coal mine:

YEAR	PRODUCTION IN TONS (1000 K.G.)	BOOK VALUE OF THE ENTERPRISE IN GLDS.	RECEIPTS IN GLDS.	WORKING EXPENSES IN GLDS.	NETT PROFITS AFTER DEDUCTING SHARE, PAID TO THE SUMATRA R.R. IN GLDS.
1919	510.821	5.336.609	7.100.512	5.569.556	1.320.163
1920	567.142	7.194.842	12.792.718	7.803.656	4.658.441
1921	602.853	8.411.202	13.758.338	9.108.478	4.252.924
1922	544.002	—.—	7.976.402	—.—	—.—

Pulu Laut. On the island of Pulu Laut, off the south-east coast of Borneo, a colliery has been worked by the Government since October 1st, 1913.

The whole island is reserved by the Government for the purposes of mining and geological research.

The centre of the mining industry is at Stagen, which is connected with the harbour of Stagen by a railway of five kilometres.

The mining is carried on in two coal seams.

The proposed extension of the mines could not be carried out immediately, on account of war conditions.

The island is favourably situated for the sale of the product, being in the direct route of the shipping lines between South Africa, Australia, Java and Macassar, with China and Japan.

In 1922 110.660 tons of coal were shipped, of which 37.5% was delivered to private parties and 62.5% to Government services and industries.

The work is chiefly done by Javanese contract coolies, the average number of which in 1922 amounted to 2.117.



WATERFALL SCENERY. THE NYMPH-BATH. (EAST JAVA)

The production which from 1907 to October 1913, amounted to 902.295 tons, reached 180.159 tons in 1919, 188.772 tons in 1920, 208.900 tons in 1921 and 113.218 tons in 1922.

Bukit Asem collieries. This third Government coal mine is located near the dusun Tandjong, 12 K.M. south=west of Muara Enim in the Residency Palembang.

For a long time it was known by various explorers that coal was found in the highlands of this province.

Originally little attention was paid to this fact, because the mineral was brown=coal. Owing to the proximity of volcanic rock (andesite) however, the coal is at different places metamorphosized into a superior quality.

The geological research of 1915 proved that great quantities of this superior quality of coal were present near Tandjong.

Firing tests gave favourable results. In connection with the existing coal shortage in the Dutch East Indies and in order to supply the Government railroads with the necessary fuel, it was decided to start a mine on a small scale by way of experiment. The coal produced was at first transported from Tan=djung to Muara Enim on a light railway, constructed in a short time by the Government railway service, loaded into the cars of the South Sumatra Government Railway and conveyed to Palembang (Kertapati), where it was shipped in the cargo steamers.

The better class coal is found in three seams, the upper, so=called A=(Mangus) seam, consisting of two banks 6 and 7 metres in thickness, inter=sected by a tuff layer from 4 to 5 metres thick, the middle so=called B=(Suban) seam, consisting of two strata of 8 and 3 metres, intersected by a stratum of clay 2 metres thick and the lower so=called C=(Petai) seam from 6 to 8 metres thickness. The seams are mutually separated by clay shales and sand, 15 metres thick between the A= and B=seams and 25 metres thick between the B= and C=seams. A fourth seam also occurs, i.e. the Merapi layer, at a depth of about 200 metres below the Petai seam.

The coal is very pure, containing not more than 3% of ashes, mostly 1 — 2%, but some kinds show an inclination to friability. During an optional contract closed by the Government with the owners of the Lematang conces=sions, situated in this region, these concessions and the adjacent grounds were investigated.

The result of this investigation was, that in 1919 the concessions were taken over by the Government.

Kinds of coal marketed. At present three kinds of coal are marketed, viz.:

1. Lematang marine coal with the qualities of semi=bituminous coal i.e. fixed carbon 58 — 60, volatiles 36—38, moisture 2 — 5%, ashes 1 — 3% and caloric value 13.000 — 14.500 B. T. U.

2. Bukit Asem coal, with all the qualities of the bituminous coal averaging say 12.000 B. T. U.



COAL LOADING AT TANDJONG PRIOK (BATAVIA)

3. Briquette-coal of the semi-bituminous type with low volatiles and the average analysis of fixed carbon 80, volatiles 17, moisture 1, ash 2% and cal. value 14.500 B. T. U.

The coal is at present screened on grizzlies and separated in lumps and small coal (0 — 30 m/m); during this year a large screenhouse will be put to work for producing in future lumps (larger than 30 m/m), nuts (10 — 30 m/m) and fines.

Modern equipment, including an electric power plant, screenhouse etc. will shortly be started to work.

Underground transport will be done by compressed air locomotives.

The production amounted in 1917 to 9.764 tons, in 1918 to 50.300 tons, in 1919 to 106.881 tons, in 1920 to 141.618 tons, in 1921 to 172.939 tons and in 1922 to 113.481 tons.

GOVERNMENT GOLD-MINING IN BENKULEN.

A mineralogical geological research, instituted by the Government, proved the existence of two gold and silver deposits of commercial value: Tambang Sawah and Lebong Simpang, both located in the district Lebong in the Residency Benkulen.

The Tambang Sawah deposit chiefly contains manganese-bearing refractory silver ore, which will be worked according to a process discovered by the engineer Caron.

Owing to war conditions the necessary tests on a large scale could only be made in America, where they took place in the station for metallurgical research at Golden near Denver, with the co-operation and instruction of Professor Clevenger of the United States Bureau of Mines. An installation for a daily production of 150 tons has been installed lately.

During the time the tests were made, preliminary work was already carried out on the spot, while a road connecting the mine with the principal town of Muara Aman was constructed by the Service of Public Works.

The service of Waterpower and Electricity built an electric waterpower plant at Tais to supply the mine with electric power. This power plant will also provide more power to the adjacent Redjang Lebong mine. The work at Lebong Simpang was started in 1920 with a small plant. The power is supplied by a small waterpower station.

In 1922 the production amounted to 70.5 K. G. of gold and 26.4 K. G. of silver.

PRIVATE GOLD-MINING. OTHER MINERALS.

From ancient times the Dutch East Indies had the reputation of being rich in gold, Java included, though this is the only island where no gold mines are found, the metal being found only very rarely.

At the end of the last century private enterprise discovered a number of places where gold was found, the result of which was that several mining companies were floated. The record of these companies on the whole has been unfavourable, but gradually sounder conditions have arisen.

Gold is found in Sumatra, Borneo and Celebes in all kinds of deposits, such as alluvial deposits, tertiary gravel beds and as lode deposits.

At the end of 1922, 72 concessions had been granted for the mining of gold and silver.

The mining of the gravel beds so far has been of small importance and dredging accordingly has met with little success. Natives are employed in the washing of river sediment.

The more important mining companies confine themselves exclusively to the working of lode deposits.

The greatest quantity of gold and silver is produced in the Residency Benkulen in Sumatra, where two mines are at present in exploitation and in the Residency West Coast of Sumatra, where one mine is at work.

The mining area, known by the name of the Lebong district (Lebong mine), is situated about 75 K. M. north of the capital and harbour of Benkulen, the Mangani mine on the West Coast of Sumatra is situated near Pajacombo to the north of Fort de Kock. The veins sometimes extend as far as 4 K. M.

Waterpower is everywhere available for the working of the ore.



CONCRETE RAILROAD-BRIDGE AT MR. CORNELIS (BATAVIA)

Another gold-mining district is to be found in the northern peninsula of Celebes, which, however, so far has failed to come up to expectations. At the present time there are three mines working.

A third gold centre is located in Central Sumatra near Padang, where the mines have been producing since 1913.

Among the other minerals found in the Dutch East Indies, besides petroleum, mention should also be made of iodine, wolframite, manganese ore, sulphur and copper ore and also diamonds in Borneo.

These mines are worked exclusively by private enterprises.

Various springs in East Java produce iodine, which is mostly shipped to Europe in the form of copper iodide. In 1915 the production amounted to 50,5 tons (of 1.000 K.G.), in 1916 to 33 tons, in 1917 to 15,4 tons, in 1920 to 15,5 tons and in 1921 to 20,6 tons.

Wolframite, manganese and sulphur are obtained in small quantities. The amounts of sulphur produced in 1911, 1912, 1913 and 1914 respectively, were 875, 305, 1236 and 300 tons (1.000 K.G.) while in the years 1915 up to and including 1922 only a very small amount was obtained.

Marble quarries are found in Java, from which among other things the stone is worked into tiles. In 1922 the productions amounted to 500 M^3.

There are also a number of lime kilns and factories of building materials. Near Padang a Portland cement factory has been established since 1911.

The factory has been enlarged and its capacity is now of 480.000 barrels a year.

The results of the diamond digging in the Archipelago suffered under war conditions in the second part of 1914. The greatest number of diamonds is found in the district of Martapura in the South and East Division of Borneo.

The number of licences granted for diamond digging amounted in 1922 to 7.055.

GOLD AND SILVER PRODUCTION IN THE DUTCH EAST INDIES

YEAR	GOLD IN K.G	VALUE IN GLDS.	SILVER IN K G.	VALUE IN GLDS.	VALUE OF DIAMOND PRODUCTION IN GLDS
1919	2.874	4.736.352	31.316	2.891.406	129.600
1920	2.757	4.543.536	31.752	3.015.805	50.000
1921	2.920	4.812.160	31.787	1.893.870	180.554
1922	3.244	5.346.112	34.515	1.997.728	168.843

PETROLEUM.

The development of the petroleum industry in the Dutch East Indies is comparatively new. The first concession was granted in 1883 in Langkat (North Sumatra) and has since been followed by several more.

At the end of 1918 the number of concessions granted and sanctioned by the Dutch East Indian Government, amounted to respectively 61 and 26, of the latter 15 especially for petroleum and other bituminous substances.

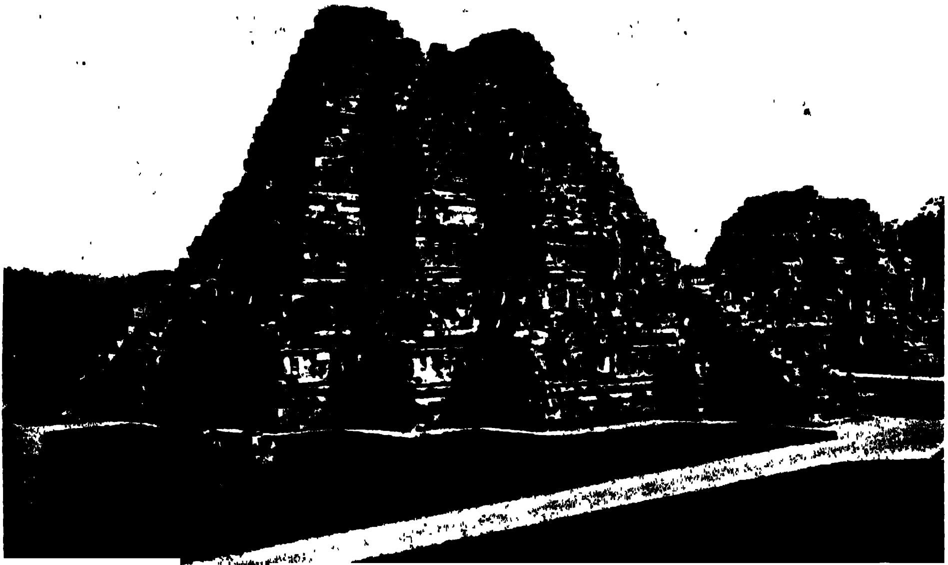
The chief centres of production are located in the provinces:

South and East Division of Borneo;
Palembang;
Acheen;
East Coast of Sumatra;
Rembang;
Sourabaya;
Amboina (the island of Ceram);

The products obtained from the crude oil are, among others: benzine, kerosene, residue or liquid fuel, lubricating oil, asphalt, paraffin wax, of which candles and batik wax are also manufactured.

The oil from the various districts differs in appearance and composition, so that it can be worked into a large variety of products.

The Sumatra oil, for instance, produces benzine, kerosene and lubricating oil, while the heavier Borneo oil yields kerosene, fuel oil and paraffin wax.



CHANDI SEWU TEMPLE RUINS (BUILT ABOUT SEVENTH CENTURY)

Benzine is put on the market in two grades; light and heavy, the one obtained from Sumatra is of the best quality. Great quantities are shipped to Europe.

Kerosene or illuminating oil finds its chief market in Java, in British India, China, Japan, Australia and East Africa; Alexandria is the most western market.

Turpine. This product serves as a substitute for turpentine.

Diesel and Solar Oil form intermediary products between kerosene and lubricating oil.

Liquid Fuel or *petroleum residue* is used as fuel in the refineries, while large quantities are shipped to different parts of the world.

Batching Oil finds a market in British India in the jute industry, where it is used to soften the fibres and to make them supple during the process of weaving.

Lubricating Oil. A modern plant for the distillation of engine oil is being constructed at Balikpapan, while two are working in Java and Sumatra.

Paraffin wax. The refineries in Java and Borneo put a large quantity of the finest paraffin wax on the market. The one at Balikpapan is one of the largest and best equipped in the world.

Part of the wax is used for the manufacture of candles which, on account of the high melting point of the Borneo paraffin wax, are particularly suitable

for use in the tropics. The factory in Java caters for local consumption, the one at Balikpapan for export.

Batik wax finds a market in Java in the domestic batik industry.

Asphalt is sold partly on the local market and the remainder abroad.

A large fleet of tank steamers carries the products to all parts of the world. The greater part is shipped in bulk, but various ways of packing are adopted, for which purpose the tin factories supply the material.

Petroleum Companies.

The principal company, which controls almost the whole manufacture and output in the Dutch East Indies, though known under different names, is the „Royal Dutch Company for exploiting petroleum wells in the Netherlands Indies" (Koninklijke Nederlandsche My. tot exploitatie van petroleumbronnen in Ned.-Indië), which was founded in 1890.

This company gradually established connections with various other companies for the buying of the crude product, its shipping and distribution, with the aim of securing for itself a place in the world market. Beyond the Dutch East Indies also, it is steadily extending its sphere of activity for that purpose.

The Royal Dutch Petroleum Company presents an example of a world wide organization, which has made it possible to bring the petroleum industry in the Dutch East Indies to a high degree of perfection.

In 1921 a law was passed by which the „Nederlandsch-Indische Aardolie Maatschappij" was registered to exploit oilfields in Djambi. In this company the Government participates for half of the capital and according to a sliding scale in the profits. The company started work in 1922, two exploration drilling plants having been erected so far.

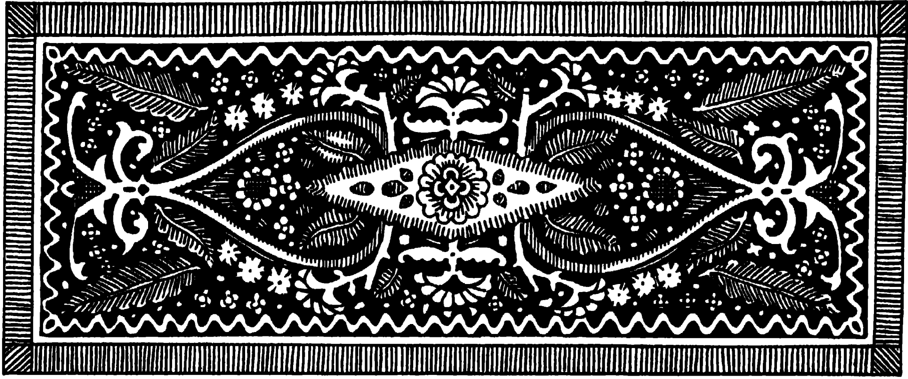
Here follow some figures regarding the production and exports:

YEAR	PRODUCTION OF CRUDE OIL IN D. E. I. IN TONS	EXPORT OF PETROLEUM PRODUCTS IN 1000 L. (INCL. PULU SAMBU)			
		BENZINE AND GASOLINE	KEROSENE	RESIDUE	TURPINE
1919	2.159.862	573.045	406.807	754.423	2.200
1920	2.365.320	489.721	352.923	268.417	6.564
1921	2.359.343	538.764	322.446	268.584	3.052
1922	2.381.924	637.696	243.380	371.021	2.497

EXPORT (IN TONS OF 1000 K.G.) OF: (INCL. PULU SAMBU)					
YEAR	PARAFFIN WAX	CANDLES	LUBRICATING OIL	ASPHALT	GREASES
1919	22.797	5.626	27.056	2.647	208
1920	18.929	5.511	16.152	1.797	220
1921	22.408	4.001	11.326	1.181	364
1922	19.417	7.074	15.086	1.582	122



INDUSTRY



CHAPTER X.

INDUSTRY.



enerally speaking the D. E. I. manufacturing industry is still in its infancy.

Many industries, which are indispensable in European countries, are lacking entirely or partly here, such as for instance the textile industry, glassworks and various others. In trying to group the existing industries, one notices in the first place the highly developed agricultural industry, which saves no expenses or trouble to bring the industry to perfection. The reason for this exertion is the necessity to place the products in large quantities overseas, such as it is the case with the sugar, tea, rubber and tapioca industry and others.

Besides these industries, which work for the oversea markets, there exist others, which must place their produce on the home markets. These industries as a rule are not very perfect. This also has its good reasons, for these industries are not without risk, many of them are threatened by foreign competitors, who are technically better equipped and are financially stronger.

Also the labour supply in the older industrial centres is generally better; while there one has to do with workmen, who are better fit for their task, here one has to train labour oneself when starting new industries. When erecting the works one has another difficulty to cope with, which is, that the whole installation has to be ordered from abroad, which makes the outlay considerably more expensive. Under these circumstances a home industry has been developed in the Dutch East Indies, which supplies in certain local wants. To these one can reckon industries, which have no foreign competition to fear, such as the ice and aerated water factories, lime kilns, tile works, gas works, electrical works etc.



MAKING BAMBOO HATS

As with the agriculture, one must make a distinction between the European and native industry. To the European industry belong the large industries, such as the engineering works, the varnish and paint works, canning factories, triplex chests factories, soap factories, a cement factory, a paper mill etc.

Of the European industries (with the exception of the agricultural industries), which work especially for the oversea markets, the petroleum industry should be mentioned in the first place. This is especially established in the immediate neighbourhood of the places where oil is found, such as in the Residency Palembang in Sumatra, in the eastern part of the Residency South and East District of Borneo and in the Residencies Rembang and Sourabaya in East Java. In these refineries all petroleum products are refined such as kerosene, benzine, lubricating oils, paraffine wax etc.

Auxiliary industries are attached to these industries for the manufacture of sulphuric acid and for the manufacture of the required canning material. The export value of the petroleum products during 1922 amounted to glds. 332.391.000.—.

Of the industries, which work especially for the home market, the most important one is the engineering industry, which is especially established in the agricultural centres. These works specialize in repairs of machinery and construction works.

Moreover the manufactory of railway materials at Cheribon should be mentioned; this new plant is equipped in a modern way and constructs railway cars and equipments.

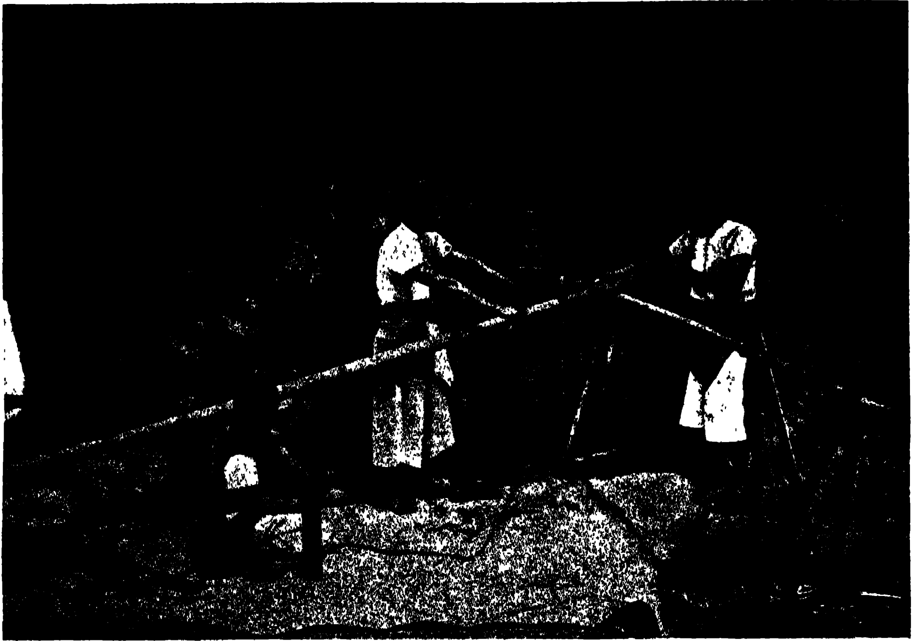
Lately the papermill at Padalarang has been opened, wich has received large contracts of the Government.

The vegetable oil industry, which occupied such an important place during the years of war, has lost its foremost place again and at present chiefly works, as far as the mills have not been closed down, for local requirements only.

To meet the demand for cement, a cement factory was established in Padang (Residency Sumatra's West Coast), which has a yearly capacity of 480.000 casks and which turns out the goods at competitive prices. Still the imports of cement for 1922 were 515.000 casks. Chemical factories are still almost lacking. The Bandung quinine factory which also turns out mostly finished products for the oversea markets however is important. Further iodine containing well water is turned into iodine preparations. The export value of the quinine preparations for 1922 amounted to glds. 5.617.000.—, while the exports of iodine and iodine preparations amounted to 73.000 K. G.

Electrical current for light and motive power is available in all bigger cities and in a number of smaller places while in addition to these there are gas works in all the bigger boroughs of Java.

Ice is manufactured in all places of some importance, while aerated water factories are found in most of the big cities. Carbonic acid is only



MAKING BAMBOO HATS

manufactured by a single factory in Java, while the balance of the requirements is covered by import.

The native industry is practically only home industry and even small at that. But there are a few however, which work for the oversea markets and have reached a certain standard of organization.

To these exceptions the hat plaiting and the batik industry belong. Millions of hats from the native plaiting works in the Residency Bantam and the Preanger Regencies are shipped each year to many countries in the world.

During 1922 of the finer quality of bamboo hats, 2.800.000 pieces were shipped abroad representing a value of glds. 847.000.—; during 1923 2.933.000 bamboo hats were exported from Java.

Of the coarser kind of pandan hats, 7.225.000.— pieces were shipped during 1922 to a value of glds. 650.000.—; while during 1923 the export from Java amounted to 12.523.000 pieces.

The batik industry supplies the bulk of the native demand for wearing apparel, but furthermore a regular export takes place to the surrounding countries from the batik centres.

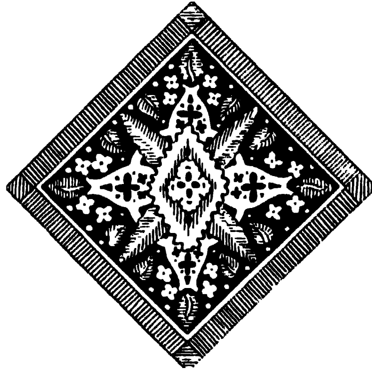
Other native industries are the brick and tile works, tanneries, coconut oil manufacture and numerous other industries of less general importance. The endeavours made by the Government to raise the quality of the native manufactures, have mostly turned out a failure, because, with the present economical condition of the population, one must be out more for cheapness of the article than for the quality of it.

Besides the private industry, there are also several industries run by the Government, which are mostly on a large scale.

The State Railways for instance have large central workshops in various places; the Army has its pyrotechnical workshop, munition and gun factories and repair shops; the Navy has an establishment with installations attached to it.

Furthermore there are the Government Printing Office and the one of the Topographical Service.

The Government wherever possible gives every support to the industry in this country. As mentioned elsewhere, there are engineering colleges for the training of mechanicians. A special section of Industry attached to the Department of Agriculture, Industry and Commerce has the task to give the best possible advice to the native as well as the European industry. Furthermore there is a committee which has charge of the promotion of the manufacturing industry.



COMMERCE.

Commercial associations.

Trade.

Patents.

Trade Marks.



CHAPTER XI

COMMERCIAL ASSOCIATIONS.



The Law acknowledges three kinds of commercial associations. Their distinction in kinds, rights and obligations of the individual participators, as well as those towards other people, who trade with the association, are described in the Code of Commerce (sections 14 — 56). With regard to the greater or lesser liability of the participators, owing to the engagements of the association, one distinguishes:

I. the firm, this is the one, which is entered into, in order to trade under a joint name and whereby each of the partners is directly and individually liable with his whole fortune towards the creditors of the concern. The private firm must be registered by authentical deed which deed or a notarial copy of it, must be filed at the registry office of the Court of Justice, in the jurisdiction of which the firm is established. The partners are also obliged to publish the said deed in the Official Gazette (the Javasche Courant).

II. the limited liability company (*Commanditaire vennootschap*), which is entered into by one person or various partners, individually liable for the whole (working or complementary partners) and one or more other persons as money lenders (sleeping partners).

The liability of the sleeping partners is only restricted to the money they have advanced, the others are fully responsible.

The same rules with regard to publication and registration apply as those for the private firms.

A stamp duty of 1½% of the paid up capital is charged for the association of a limited liability company or a private firm.

III. the limited company (*Naamlooze Vennootschap*), which can be



RIVERSIGHT NEAR BANDJERMASIN. SOUTH BORNEO

entered into by two or more persons, the partners each being liable for their share in the capital of the company.

The association must decidedly be done by a notarial deed, in which all details have to be given as to the board of directors, the articles of association, the purpose of the capital, the division of profits etc. of the company.

Before a limited company can be established, the aforesaid deed of settlement must be approved by the Governor-General, after the advice of the Director of Justice has been taken. This approval is granted, when the company is not in defiance of the good morals or the public order and if there are no serious objections against the registration, neither may the deed contain stipulations, which clash with the legal regulations.

The complete deed must be published in the Official Gazette and filed at the registry office of the relative Court of Justice.

The same applies to any alterations in the deed of settlement.

The capital of the company is divided into shares, which either may be „to bearer" or nominal shares.

The first promotors must at least represent together one fifth of the share capital. The company cannot start operations before one tenth of the capital has been paid up in cash.

A stamp duty of 1½% of the paid up capital is charged for the floating of the company. The whole of the capital must be paid up within ten years after the floating of the company, which period can always be prolonged, but is subject to the approval of the Governor-General.

The Board of Directors of a company cannot be appointed for life.

With companies insuring certain objects, the maximum amount of insurance on certain objects, which may not be exceeded, must be fixed in the deed of settlement.

Recognized foreign companies of good standing are permitted to be established in this country, without requiring the permission of the Government.

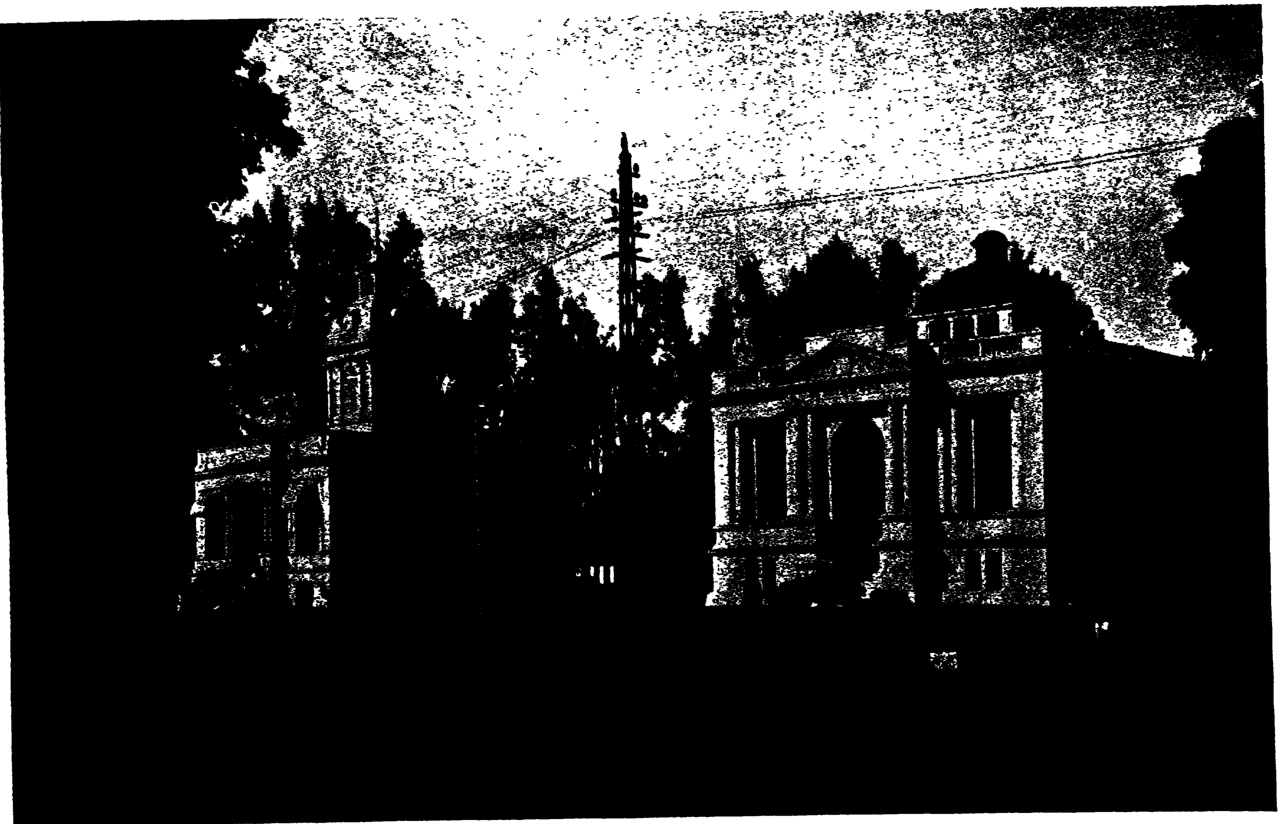
TRADE IN THE DUTCH EAST INDIES.

From a political economical point of view, the purpose of trade is the export of products of which the country has a surplus and the import and distribution of articles which are wanted.

In Europe export is chiefly limited to articles of industry and import to food and raw materials, as opposed to the D.E.I., where the surplus of agricultural products and raw materials are exported and finished articles are imported.

The D. E. Indies produce large quantities of very important cultivated and natural raw materials.

The principal products are sugar, rubber, cinchona, tea, coffee, cassava, tobacco, sisalhemp and others. One of the most recent additions is the oil palm, the cultivation of which shows a very bright future.



THE JAVA BANK BUILDING (RIGHT, AND TOWNHALL (LEFT) AT MEDAN

Of the indigenous products pepper, nutmeg and other spices, copra and kapok should be mentioned.

Beside these cultivated products, the so-called forest product, such as rattan, gum and resin are also an important item of export.

A considerable portion of the exports consists of minerals and especially petroleum and tin.

The products mentioned above are the principal ones and taken together constitute about 95% of the value of the total Dutch East Indian exports.

Besides these, there are still numerous less important articles of export, such as shells, birdskins, maize, rice, gold, silver, tanning materials, coca, vanilla, essential oils, cotton, ebony, teak and other timber, etc. etc.

Import trade supplies the Dutch East Indies with finished and half finished articles and articles required for industry and daily wants.

The principal articles of import are:

a. rice, soya-beans and dried fish, especially for the needs of the native population, flour, butter, milk products, all kinds of canned foods, beer, wine and other beverages, cigars and cigarettes, all kinds of delicacies and provisions, pharmaceutical articles etc.

b. cotton goods, linen and silk, clothing material, shoes, all kinds of haberdashery and hardware, such as lamps, pots and pans, knives, china and glassware, pottery, toys etc.

c. machinery, engines and motors, iron and steel, semi-manufactured articles and all sorts of products of the metal industry, motorcars and trucks, bicycles, synthetic dyes and paints, artificial manures and chemicals, building materials, etc. etc.

Technical organization.

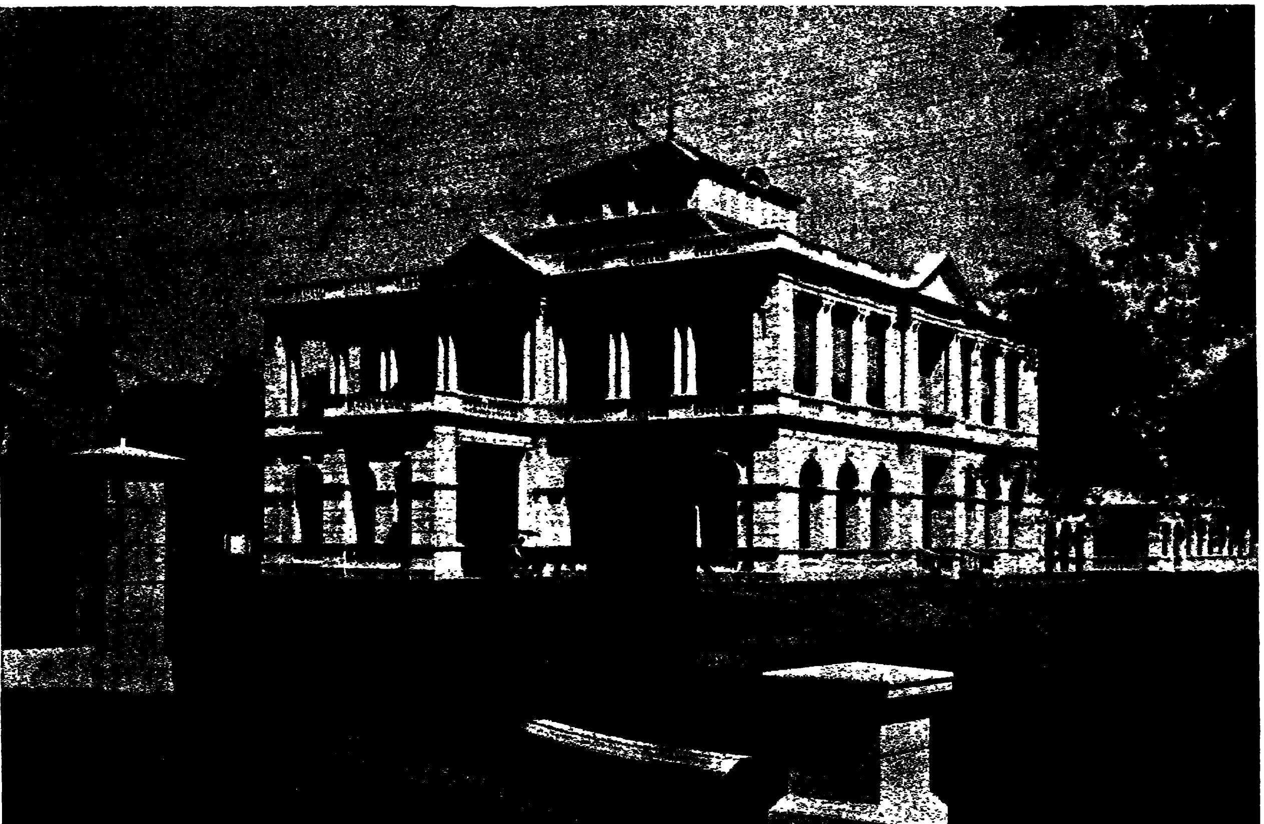
Wholesale trade. The wholesale trade in the D. E. Indies is chiefly carried on by European dealers; trade is international, but Dutch business naturally has a considerable preference, although it is closely followed in extent by English trade, which even predominates for some products such as tea, rubber and sugar.

Moreover numerous German, French, Japanese, American and other firms also carry on business in the D. E. Indies.

With one or two exceptions the headquarters of all the larger firms are established in Europe; these firms are generally limited companies (Naamlooze Vennootschap).

Import as well as export business is done by most of these firms, a small number being limited to export only, i.e. to general export. Among the latter are several firms which specialise in products, such as sugar, tea, etc.

In the course of time, but especially during latter years, a definite change has taken place in the nature of export trade, although the principle of sending products in consignment to Amsterdam, where they are sold at the different auctions, was initially maintained. Gradually however modifications took place



THE OFFICE BUILDING OF THE DELI MAATSCHAPPIJ AT MEDAN

as markets were established in the D. E. Indies, where America and Australia made their purchases. The D. E. Indian Government also kept pace with the time and stipulated that Government products, such as rubber and tin should no longer be sold by the „Nederlandsche Handel Maatschappij" at Amsterdam, but in the D.E. Indies. The D.E. Indies now no longer constitute the colonial market of former years, but a market that is ranked among the world's commerce. Quotations from all parts of the world, are received daily, business transactions being chiefly done here, e.g. sugar has a selling organization of its own.

The transition from export to import is formed by the firms which carry on both lines of business. These firms supply the Chinese upcountry with goods on credit, in settlement of which products from the interior are often supplied.

The same may be observed for importing firms, which often export goods on a small scale.

Importing firms generally specialise in a definite direction e.g. textiles and hardware being the chief line of business next to other articles.

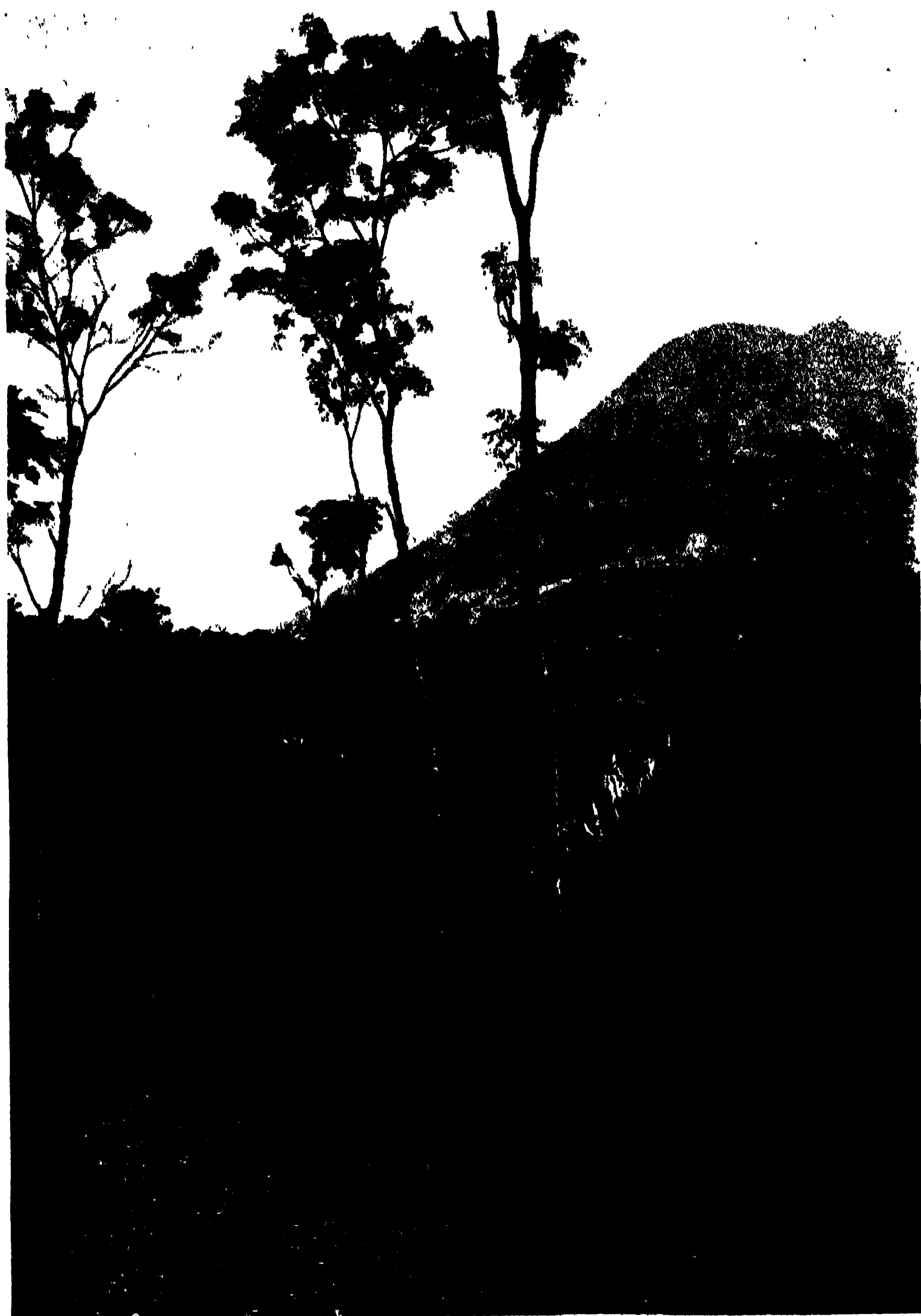
Intermediate trade. As already mentioned in the wholesale trade, the European element predominates for import as well as for export, although in latter years an inclination in this direction has been observed among the Chinese. Intermediate trade however is chiefly limited to Chinamen; they are the link between the European wholesale trade and the native. In a far smaller degree we also have the Arab as intermediate trader, chiefly for linen. In the coast-towns Chinese trade with China and Singapore is considerable, but is limited with British India.

In the D. E. Indies the Chinese are the intermediary traders „par excellence", having been able to adapt themselves to the peculiarities of the native population. Chinese are met with as peddlers in the interior, as shopkeepers in the smaller towns, but also as owners of large and modern stores in the chief towns.

Chinese not only take a share in the distribution of goods, but they also collect products in the interior, either by supplying the native with advances on their crops or by accepting products in settlement of articles of import supplied.

Retail trade. Only the small market retail trade is chiefly limited to the native population; native wholesale trade is altogether out of the question, at its best, we may speak of an incidental intermediate trade. The majority of the native population is still in the stage of barter-economy, only a small portion having attained the stage of money-economy, although a gradual development in this direction may be observed.

In Java native trade is chiefly limited to retail market business, which supplies the daily needs. In some parts of the Outer Districts conditions are somewhat different, owing to the fact that certain products are cultivated and sold by the natives in larger quantities for export.



COUNTRY-ROAD IN JAVA

This difference in commercial spirit is evident from the statistics of the people's Credit Banks according to which 23% in Java and Madura and 50% in the Outer Districts of the loans is used for commercial purposes, half being employed for retail trade in Java and Madura against only one tenth in the Outer Districts.

Commercial organizations. The different groups of the wholesale, commis= sion and retail business, have joined in various associations for the protection of common interests and coöperative action.

The principal ones are the Trading Associations, representing the wholesale interests.

Such associations are established at Batavia, Samarang, Sourabaya, Bandung, Macassar, Medan, Padang, Palembang, Menado and a few smaller coast=towns.

Of the same nature are the Importers Associations, the Brokers Associa= tions, the Shopkeepers' Associations etc.

Besides these purely private organizations, there are official Chambers of Commerce and Industry, which are intended as a link between the Trade and the Government.

The Government organ, whose task is to look after the commercial matters in the interest of the community, is the Division of Commerce of the Department of Agriculture, Industry and Commerce, established at Buitenzorg.

This department supplies any one with all required general information concerning the trade in the D. E. I. and gives its intermediary for the establishing of new connections; it publishes a weekly bulletin, an annual report, directories etc.

Credit and financial system. The financing of the wholesale import and export trade is carried out in the same way in the D. E. I. as in Europe and the U.S.A.

For this purpose there are many Banking institutions, as mentioned in the Chapter „Banking Institutions" elsewhere.

The exports are generally financed in the following way: on application of the seller in the D.E.I. the foreign buyer opens through the intermediary of a home bank (the issuing bank), a credit to the seller with one of the local banks (the advising bank), against which credit the seller may draw on surrender of the shipping documents. These drafts are negotiated in the open market, chiefly at Batavia, and generally are bought by the local banking institutions.

The imports are generally financed by the seller making a draft on the buyer in the currency of the exporting country. One proceeds as follows: the exporter writes out his bill, preferably c.i.f. port of destination, adding interest, calculated from the day of the draft till the day of payment. The draft is generally handled in two ways: as D/P, in which case the collecting bank in the D. E. I. presents the draft to the buyer for acceptance, but withholds the documents, which are only surrendered against payment; or as D/A draft



SOUTH COAST OF JAVA

in which case the documents are surrendered after acceptance of the draft by the buyer.

In the case the goods arrive at the port of destination before the documents, they may be delivered on a guaranty of the bank to the shipping company.

The intermediate trade has often a very large credit from the wholesale houses, which often rests for a large part on individual trust.

Supplies are as a rule given on 30 days credit, but many exceptions are made to this rule; credits for 2 to 3 months and also longer, are of common occurence.

With such long credits, viz. of 3 months and longer, deliveries as a rule are made against bills of acceptance.

The D. E. I. Imports and Exports.

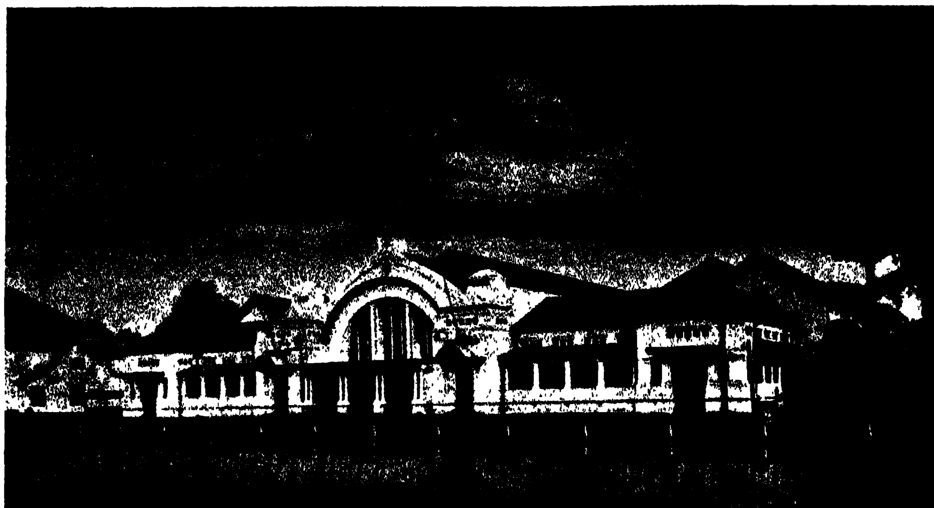
The trade of the D. E. I. is practically directed to all parts of the world. The Dutch East Indian products go everywhere and the Dutch East Indies obtain their supplies from a great number of countries.

The principal oversea markets for the Dutch East Indies are Holland, Great Britain, the U. S. A., Japan, Australia and British-India, while Singapore has a very prominent part as a distribution and transhipment centre.

The following statistical surveys give a clear idea of the total extent of the Dutch East Indian import and export trade.

Below is given a survey of the value of import and export for the years 1920 up to and including 1922 (in 1.000 Guilders):

IMPORT	1920	1921	1922
For private account.			
A. Java and Madura: goods	819.353	803.686	499.397
coins	64.325	22.778	10.987
B. Outer Districts: goods	306.051	289.121	196.875
coins	831	1.843	1.353
Total	1.191.060	1.117.428	708.612
For Government account.			
A. Java and Madura: goods	100.975	99.114	58.122
coins	11.050	11.872	8.866
B. Outer Districts: goods	7.738	15.995	7.182
coins	2	—.—	—.—
Total	119.765	126.981	74.170
General total	1.310.825	1.244.409	782.782



THE POST-OFFICE AT WELTEVREDEN

EXPORT	1920	1921	1922
For private account.			
A. Java and Madura: goods	1.504.594	661 342	521.234
coins	4.422	705	51
B. Outer Districts: goods	726.712	531.650	621.181
coins	3	12	—.—
Total	2.235.731	1.193.709	1.142.466
For Government account.			
A. Java and Madura: goods	3.137	2.097	1.376
coins	—.—	100	410
B. Outer Districts: goods	—.—	3	4.643
coins	—.—	—.—	—.—
Total	3.137	2.200	6.429
General total	2.238.868	1.195.909	1.148.895

The preceding survey shows, that the commercial balance of the East Indies, with the exception of 1921, was continuously favourable.

During that year the imports exceeded the exports, which had not occurred since 1883.

The difference in economical importance of the main isle of Java, compared with the other islands of the Archipelago, is clearly striking, when

considering the following totals, in which the total import and export for private account for Java and Madura on the one hand and the Outer Districts on the other hand are analysed in absolute value and in percentage of the total. The values are given in millions of guilders.

IMPORT.

YEAR	JAVA AND MADURA	PERCENTAGE	OUTER DISTRICTS	PERCENTAGE	TOTAL
1920	819.9	72.8	306.1	27.2	1.126.0
1921	803.7	73.5	289.1	26.5	1.092.8
1922	499.4	71.7	196.9	28.3	696.3

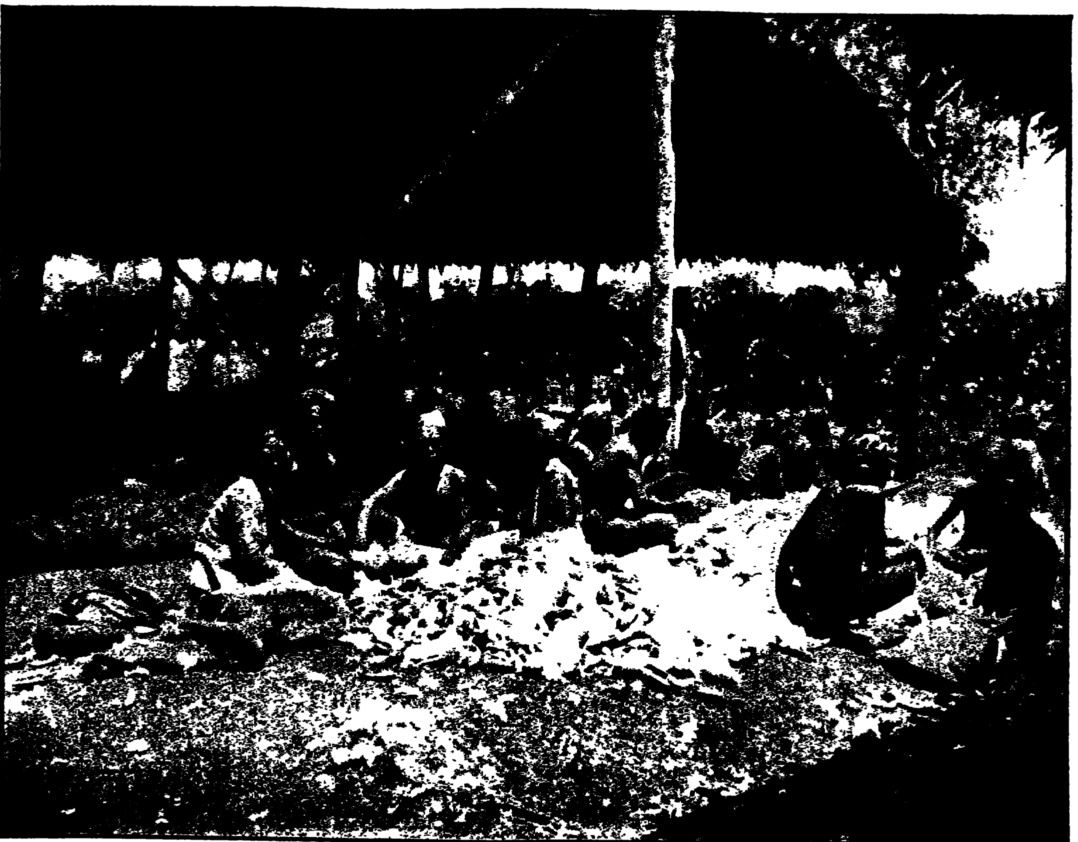
EXPORT.

YEAR	JAVA AND MADURA	PERCENTAGE	OUTER DISTRICTS	PERCENTAGE	TOTAL
1920	1.504.6	67.4	726.7	32.6	2.231.3
1921	661.3	55.4	531.7	44.6	1.193.0
1922	521.2	45.6	621.2	54.4	1.142.4

The importance of the principal countries for the D. E. Indian trade is further indicated in the following percentage figures. As will be seen from these surveys, Holland appears to be the chief market of the D.E Indies as a country of destination as well as of origin, but the colony is also an equally very important buyer from and provider for Great Britain, the U. S. A. and Japan.

IMPORT

ORIGIN	1920	1921	1922
	PERCENTAGE	PERCENTAGE	PERCENTAGE
Holland	23.6	25.0	22.6
Great-Britain	18.5	13.4	14.7
Singapore	11.2	12.5	13.8
U. S. of America	14.6	10.1	4.6
Japan	12.0	8.0	8.3
China and Hongkong	3.5	4.4	4.4
British-India	1.6	3.6	3.9
Australia	3.2	3.5	4.3
Sweden and Norway	0.8	0.4	0.6
France	0.5	0.8	0.8
Belgium	0.6	0.6	0.7
Italy	0.7	0.9	1.5
Phil. Islands	0.1	0.1	0.1
Siam and Indochina	1.8	6.4	5.1
Germany	3.3	5.3	6.6



KAPOK. THE FIBRE IS SEPARATED FROM SEEDS AND HULL

EXPORT

DESTINATION	1920 PERCENTAGE	1921 PERCENTAGE	1922 PERCENTAGE
Holland	15.9	18.1	15.9
Singapore	12.3	15.2	19.4
Great-Britain	6.5	4.4	5.3
U.S. of America	13.4	5.9	8.4
British-India	9.7	15.5	6.8
Japan	6.3	9.2	10.2
China and Hongkong	7.5	11.6	7.6
Australia	4.6	2.5	4.7
Sweden and Norway	2.3	0.1	0.1
France	0.9	1.4	3.3
Belgium	0.7	0.1	0.2
Denmark	0.3	0.8	0.6
Italy	1 3	1.5	0.5
Phil. Islands	0.3	0.4	0.7
Siam and Indochina	0.5	0.7	1.0
Germany	0.4	1.2	1.5

Finally follows a comparative survey of the values of a few of the chief imports and exports during the years 1920/'22 (in 1.000 guilders).

IMPORT

ARTICLES	1920	1921	1922
Earthenware	8.697	9.809	7.796
Biscuits	5.455	2.921	3.254
Butter	8.724	7.887	5.370
Cement	17.089	10.350	3.567
Chemicals	9.149	5.208	6.540
Yarns	11.269	14.383	8.822
Textiles	366.216	255.131	182.531
Wheat flour	8.254	13.912	10.529
Haberdashery	10.849	10.227	8.151
Milk	5.526	7.850	7.278
Manures	48.343	21.227	16.246
Paper	18.967	13.730	8.089
Rice	38.880	114.160	74.947
Cigars and Cigarettes	23.279	28.793	26.523
Paint	11.004	9.792	5.984
Iron and Steel Iron and Steel good Machines	195.180	205.274	77.238



BAMBOO FLOATS

EXPORT.

ARTICLES	1920	1921	1922
Sugar and molasses	1.050.136	414.880	270.861
Tobacco	170.243	91.786	77.262
Copra	92.847	87.240	81.471
Rubber and gutta percha	194.936	69.268	89.419
Tin	64.749	39.219	50.943
Oils (essential and vegetable)	72.477	23.832	3.935
Coffee	50.980	26.773	41.467
Tea	39.526	23.024	40.725
Fibres	26.262	27.521	27.473
Quinine	18.309	16.791	5.617
Tapioca and sago	16.134	11.510	14.846
Pepper	14.100	15.363	12.727
Hides	12.669	5.426	8.034
Cinchona bark	9.594	8.684	7.661
Gums	11.203	4.075	6.954
Oilseeds	3.637	1.706	2.112
Teakwood	1.967	113	267

Though, by the previous tables, a detailed general picture is given of the D. E. Indian commerce in a most concise and speaking way, some articles must be dealt with separately, owing to their special importance.

IMPORT.

Cotton Piecegoods constitute the principal group amongst the imported articles.

The Dutch East Indies take third place among the world markets for cotton textiles, being exceeded only by British=India and China.

As there is no textile manufacture of any importance in the D. E. I., all requirements must be covered by imports, which consequently represent the needs of this country.

The enormous demand is clearly proved by the importfigures, which in 1913 amounted to more than 110 million guilders and during the last three years amounted to respectively 366.2, 255.1 and 182.5 million guilders.

The chief suppliers are Holland, Great Britain and Japan, which during the last few years have been waging an exciting war for the lead.

Whereas Great Britain was the chief supplier until a short while ago, Japan has succeeded in ousting her from the first place, as far as the raw



THE ESPLANADE AT MEDAN

unbleached drills and shirtings are concerned, while Holland is the largest supplier of bleached woven cottons.

The most current kinds of fabrics are cambrics, shirtings, supers, drills, prints and fancies.

The cotton piecegoods market is principally in hands of some large, well financed Dutch firms, working with assistants, trained in the textile centres of Europe.

British firms come next, having an important share in the trade. The retail trade is carried on by Chinese and Arabs.

Iron and Steel, Iron and Steel work, Machinery. This group of articles comes second after the piecegoods.

The imports during the years 1920/1922 amounted to 195.2, 205.3 and 77.2 million guilders.

This group includes an exceedingly large variety of articles, the chief ones, as far as the metals go, are galvanized roofing and ceiling iron, iron and steel in sheets and plates, wire nails and nails, ordinary and patent axles, tinplates.

The chief countries of origin during the last few years were the U. S. A., Germany, and Great Britain.

A large variety of machinery is also required of which Holland, the U. S. A. and Great Britain are the largest suppliers in the numerical order given.

Rice is the next most important import article.

The Dutch East Indies do not produce sufficiently to supply their own needs, which makes it necessary to import large quantities each year.

Chief suppliers are Rangoon, Saigon and Bangkok.

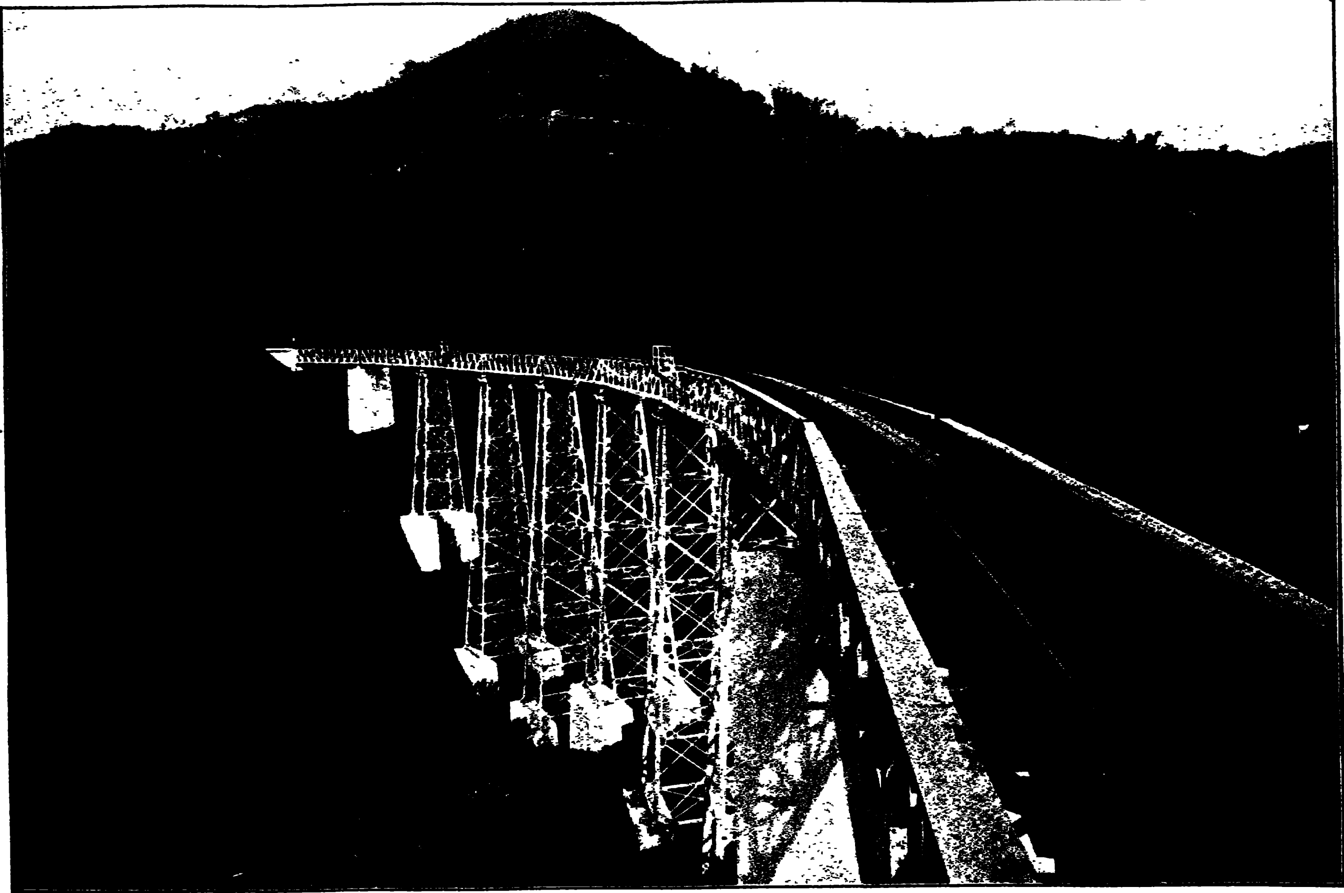
The imports amounted to (in 1.000 K. G.):

	1920	1921	1922	1923 *)
Siam rice	15.165	160.640	158.577	115.171
Saigon rice	70.206	442.885	253.500	37.994
Br. Indian rice	2.367	132.458	199.510	156.408
Other kinds	17.148	12.371	12.747	7.649

Exporters in Rangoon, Saigon and Bangkok are connected with brokers here. The contracts are closed on F. A. Q. O. T. S. (fair average quality of the season); while nearly always sales are forward.

Butter and Flour, two important articles of food for the European population, are obtained for the greater part from Australia, which has ousted Holland, being in former years the chief supplier of butter.

*) preliminary figures.



RAILWAY BRIDGE IN THE PREANGER (JAVA)

The total imports of these articles for the last three years (in 1.000 K.G.) amounted to:

BUTTER

DESTINATION	1920		1921		1922		1923	
	TOTAL	SHARE OF AUSTRALIA	TOTAL	SHARE OF AUSTRALIA	TOTAL	SHARE OF AUSTRALIA	TOTAL	SHARE OF AUSTRALIA
Java and Madura	2.455	1.916	2.671	1.984	2.237	1.984	2.636	2.352
Outer Districts	612	399	519	293	560	384	*	*
Total	3.067	2.315	3.190	2.277	2.797	2.368		

FLOUR, ALL KINDS

DESTINATION	1920		1921		1922		1923	
	TOTAL	SHARE OF AUSTRALIA	TOTAL	SHARE OF AUSTRALIA	TOTAL	SHARE OF AUSTRALIA	TOTAL	SHARE OF AUSTRALIA
Java and Madura	27.468	17.466	29.171	20 341	29.123	28.688	28.502	28.228
Outer Districts	12.352	7.147	13.581	8.137	13.399	11.125	*	*
Total	39.820	24.613	42.752	28.478	42.522	39.813		

Artificial Manure, and especially sulphate of ammonia is one of the most important import articles, because it is indispensable for the Java sugar industry.

The imports of sulphate of ammonia for the last three years (in 1.000 K.G.) amounted to:

DESTINATION	1920	1921	1922	1923
Java and Madura	111.553	57.989	69.516	81.541
Outer Districts	209	730	1.689	*
Total	111.762	58.719	71.205	

Great Britain is the largest supplier, after which follow Germany and Holland.

Paper has so far also been a very valuable article of import.

The value of all kinds of paper imported during the last three years (in 1.000 guilders) amounted to:

DESTINATION	1920	1921	1922
Java and Madura	16.221	10.790	6.135
Outer Districts	2.746	2.940	1.954
Total	18.967	13.730	8.089

* Not yet available.



THE OLD TOWN-GATE AT BATAVIA

EXPORT.

Sugar. Of the export articles of the Dutch East Indies, sugar is the most important one.

Exports of sugar during the last four years (in 1.000 K. G.) amounted to:

1920	1921	1922	1923
1.513.780	1.677.080	1.435.776	1.824.650

Java sugar goes to a great number of destinations, the principal markets however are China (Hongkong), British India, Japan and Europe.

No refined sugar is manufactured in Java, but the manufacture of the white millsugar has reached such a grade of perfection, that the best qualities as regards purity and whiteness are almost equal to the refined products.

According to the grade of colour the product is classified by number, ranging from a very dark colour No. 8 to practically white sugar No. 25.

For commercial purposes the sugar is distinguished in a smaller number of assortments, that is to say superior head sugar, being sugar with a grade of colour of at least 25; head sugar No. 16 — 20; further muscovados grade of colour 12 — 14; molasses, grade of colour 8 and higher and 10 and higher.

Other commercial distinctions depend on the manufacturing process, with or without consideration of the grade of colour.

So e.g. superior soft sugar, being the whitest kind of second boilings, grade of colour at least 25, obtained from the sirups of superior head sugar; further bag sugar obtained by the thickening and the crystalizing of less pure

sirups. One can let this mass drip through a special kind of bags, and then call it ordinary bag sugar or the mass is put through the centrifugals and called centrifugal bag sugar.

The exhausted molasses also form a commercial article. The molasses as such are largely applied as raw material in the manufacture of alcohol and arrack; in hardened form the product is exported to British-India.

With a few exceptions all sugar estates are amalgamated in the United Java Sugar Producers' Association at Sourabaya, which is the central sales-agency for this industry since a few years.

Further considerable quantities of sugar are sold second hand on the produce markets in Sourabaya, Samarang and Batavia; sugar is quoted in guilders per picul (61.76 K. G.).

Besides European exporters, Chinese, Japanese and British-Indians occupy an important position in the sugar market.

The chief shipping ports for sugar are Sourabaya, Samarang, Cheribon Pasuruan and Probolinggo.

Tobacco is after sugar the most important export article according to value. Exports during the last four years (in 1.000 K. G.) amounted to:

ORIGIN	1920	1921	1922	1923
Java and Madura	103.243	31.414	36.248	37.753
Outer Districts	22.129	14.800	15.839	15.427*
Total	125.372	46.214	52.087	53.180

According to the value, the exports amounted to (in 1.000 guilders):

ORIGIN	1920	1921	1922
Java and Madura	45.608	10.802	20.553
Outer Districts	124.635	80.984	56.709
Total	170.243	91.786	77.262

The Sumatra tobacco is the highest in value, as the estates only aim at producing the valuable wrapper, as the other qualities, owing to the high costs of production, do not pay.

On the estates in the Vorstenlanden (principalities in Central Java) they produce besides leaves for wrappers, those for filling etc. (Vorstenlanden tobacco).

* preliminary figure.

Besides Deli (Sumatra) and the Vorstenlanden, the Residency Besuki is of importance for the European market.

Besuki tobacco is distinguished in Besuki „leaf" and „krossok". Leaf is the best leaf of the plant, while „krossok" is the less carefully prepared inferior leaf.

The bales of Deli and the Vorstenlanden weigh 80 K. G., in Besuki however 100 K. G.

The big market for Sumatra and Java tobacco is Amsterdam, where the tobacco is offered by tender.

During late years it has however repeatedly happened, that Vorstenlanden tobacco was shipped direct to the U. S. A.

Krossok is especially of importance to Central European countries, but since the armistice, exports have declined continuously.

Copra. One of the chief export products, which is of continuously growing importance,e specially for the Outer Districts, is copra, as pecific native product.

Copra is the ripe kernel of the coconut dried in the sun or artificially.

The exports of copra during the last four years (in 1.000 K. G.) amounted to:

ORIGIN	1920	1921	1922	1923
Java and Madura	49.735	94.014	50.896	53.168
Outer Districts	132.318	217.558	288.569	268.399
Total	182.053	311.572	339.465	321.567

Holland is by far the largest buyer of this product, followed by Germany, France, Great Britain and the U. S. A. in numerical order.

In the copra trade there exist only a few qualities viz. F. M. S. (fair merchantable sundried) and mixed, while copra, for which the seller does not wish to take any responsibility is sold as telquel; conditions are further as a rule export dry, 5 — 6% of water.

F. M. S. is the term for all well dried ripe copra, which has not been touched by smoke. Mixed is the term for copra, which smells smoky and further for mixtures of copra dried in the sun and artificially. Java copra quotes highest.

Rubber. During late years the exports of rubber have become an item of increasing importance for the economic life of the East-Indies. The production is a considerable percentage of the total world production of plantation rubber, while the conditions for an extension of the industry are very favourable.

The exports of rubber for the last four years (in 1.000 K. G.) amounted to:

ORIGIN	1920	1921	1922	1923
Java and Madura	31.236	29.314	31.926	34.079
Outer Districts	59.224	44.191	73.016	105.676
Total	90.460	73.505	104.942	139.755

The U. S. A., Great Britain and Holland are the largest buyers.

The qualities of plantation rubber are distinguished in Java Standard ribbed smoked sheets and Java Standard pale Crepe, other qualities must be precisely mentioned in the contract. Parcels are sold in quantities of tons, 1% more or less at buyers option.

The chief markets for rubber are Batavia and Sourabaya.

In the first mentioned place the Netherlands Indian Association for the Rubber Trade is established, which Association looks after the interests of the Rubber trade and registers the contracts.

Quotations on the Batavia market are in cents per ½ K. G.

As was already mentioned in the chapter Agriculture the native plan- tations of rubber in the Outer Districts cover large areas. This rubber, prepared in a primitive way, is chiefly shipped to Singapore and purified there before it is exported. This native rubber is becoming more important every day. Exports of native rubber in 1923 amounted to 53.000 tons.

The U. S. A. are by far the chief market, then follows Great Britain.

Gutta percha is quite a different product from rubber with special properties.

It is principally applied in the manufacture of submarine telegraph cables, golf balls etc.

It is chiefly gathered as a jungle product and principally in Borneo, but in Java the Government has a gutta percha estate, the only one in the world, on which the tree, which supplies the best product, is cultivated systematically and the product manufactured under scientific supervision.

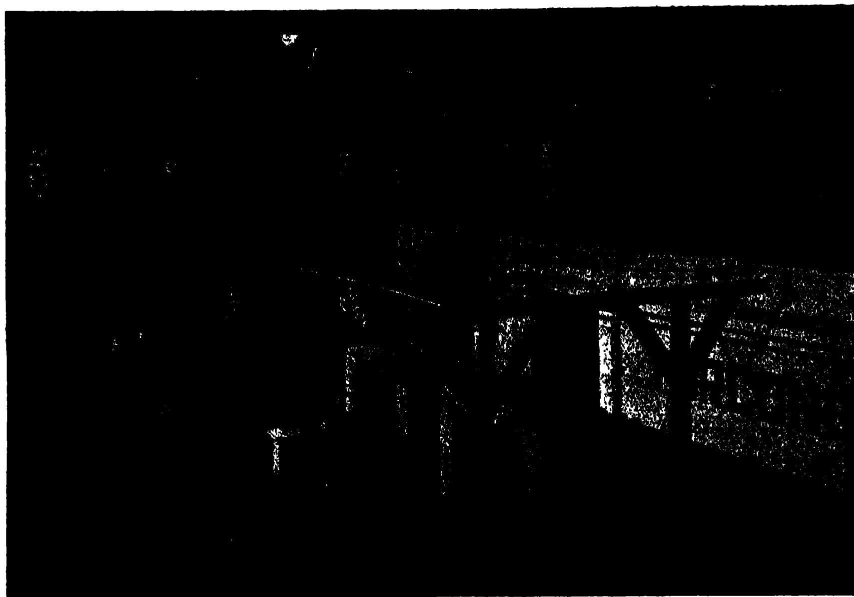
The result is a highly finished product of superior quality.

The chief market for the gutta varieties is Singapore.

The private exports of gutta percha and other gutta varieties for the last four years (in 1.000 K. G.) amounted to respectively:

YEAR	GUTTA PERCHA		JELUTONG		OTHER VARIETIES	
	JAVA AND MADURA	OUTER DISTRICTS	JAVA AND MADURA	OUTER DISTRICTS	JAVA AND MADURA	OUTER DISTRICTS
1920	4	1.003	—	5.369	57	2.890
1921	—	545	—	808	—	1.024
1922	—	565	—	2.015	—	1.492
1923	167	*	—	3.141	—	*

* not yet available.



WIRELESS STATION MALABAR

Tin. The Dutch East Indies are one of the three big world producers of tin. Rich tin strata are found on the two islands of Banka and Billiton, while tin ore is also found on a few islands of the Riouw Lingga Archipelago such as Singkep.

In Banka a large Government industry for the winning of the metal has been organized and the Banka tin has a world wide reputation as being the purest tin, with a percentage of 99.9% tin.

In Billiton and the Riouw Lingga Archipelago the ore is exploited by private concerns. The ore is shipped to Singapore to be smelted.

The Bankatin has been sold in Batavia since 1914, the Billiton and Singkep tin chiefly in Singapore.

The exports of tin and tin ore during the last four years (in 1.000 K. G.) amounted to:

TIN

ORIGIN	1920	1921	1922	1923
Java and Madura	13.550	13.539	15.458	15.165
Outer Districts	91	8	401	1.230
Total	13.641	13.547	15.859	16.395

Tin ore

ORIGIN	1920	1921	1922	1923
Outer Districts	9.380	11.911	18.172	20.642

Holland and England are the largest buyers, while Japan and the U.S. of America are getting very good customers.

Germany and France are also good markets.

Oils (Fatty). During the waryears a great industry for the pressing of fatty oils, especially coconut oil, was established in the Dutch East Indies.

After the expiration of the war, this industry has collapsed almost entirely, as the oil can be produced cheaper and better in Europe from the raw material, the copra.

The palmoil, which so far is produced in the Residency Sumatra's East Coast is continually getting more important.

The article produced here with a small free acid percentage is far superior to the African products. Besides the oil, the kernels are also shipped.

Essential Oils. The manufacture of essential oils, which was already of importance before the war, has maintained itself.

Citronella-oil is by far the chief scented oil.

Numerous other essential oils are manufactured such as Cananga, Patchouly oil, also the medicinal kajuput and sandalwood oil, but in negligent quantities.

Of the patchouly and sandalwood oil the raw material, the patchouly-leaf and the sandalwood are chiefly exported.

Citronella-oil. The Dutch East Indian product is more valued than Ceylon oil, owing to its higher percentage of geraniol; sales are made on a basis of 85% geraniol.

Citronella-oil is especially used by soap manufacturers, owing to the geraniol, one of the chief ingredients of rose oil.

Exports for the last four years (in K. G.) amounted to:

ORIGIN	1920	1921	1922	1923
Java and Madura	434.445	273.140	429.628	477.758
Outer Districts	2.790	730	—.—	—.—
Total	437.235	273.870	429.628	477.758

Chief buyers are Holland, Great Britain, U. S. A. and Japan.
This oil is chiefly produced in West-Java.

Cananga Oil. This oil is also chiefly produced in West-Java, but on a decreasing scale. The oil shows a similarity to ylang-ylang, which is grown in Reunion and the Philippines.

Lemongrass Oil. The value of this oil depends on the percentage of citral, which, for Java oil, amounts to 75 — 85%.

The Java product has to compete with the British-Indian and the Cochin-China oil.

It is used in the manufacture of synthetic perfumes, such as sweet peas scent, known under the name of ionone.

Kajuput Oil is a medicinal oil and is produced in the islands Ceram and Buru.

The chief market is Macassar. The bulk of it is shipped to Singapore.

Petroleum and Petroleum products. The Dutch East Indies are the most important territory for the petroleum industry in Asia and furthermore belong to one of the chief petroleumdistricts of the world, though it takes the place after the U. S. A., Mexico and Persia.

The principal oil fields are found in the North and South of Sumatra and on the eastside of Borneo, while in East-Java there are also considerable wells.

The Dutch East Indian oil is especially rich in gasoline, but all other kinds of petroleum products are also derived from the crude oil.

The total value of the exports of petroleum and petroleum products for the years 1920/'22 (in millions of guilders) amounted to:

ORIGIN	1920	1921	1922
Java and Madura	7.4	3.5	2.5
Outer Districts	302.7	262.3	329.8
Total	310.1	265.8	332.3

The products nearly exclusively go to the surrounding consuming countries.

The chief producer is the "Royal Dutch."

The operations are divided in the following way:

The Bataafsche Petroleum Mij. is the producing company.

The Bataafsche Petroleum Mij., Handelszaken, has charge of the sales of the products of the Bataafsche Petroleum Mij. for the whole of the Dutch East Indies.

The Netherlands Indian Tank Steamship Coy carries and distributes the crude and refined product in the Dutch East Indies and to a certain extent also outside the Dutch East Indies.

The Anglo Saxon Petroleum Coy takes charge, for the largest part, of the shipping and transportation to destinations outside the Dutch East Indies.

The Asiatic Petroleum Coy Ltd. amongst others, sells the products in the Far East, British-India, Straits Settlements, Malay States, Philippines, Egypt and Australia.

Coffee. The Dutch East-Indies are a considerable producer of coffee.

The Robustacoffee, which forms the bulk of the total exports, has secured a firm market for itself.

Besides this quality the East Indies supply a large variety of high class fancy coffees, most of them local varieties of the Coffea arabica.

The exports of coffee (all kinds) during the last four years (in 1.000 K. G.) amounted to:

ORIGIN	1920	1921	1922	1923
Java and Madura	43.784	30.784	43.314	21.481
Outer Districts	17.329	12.899	14.046	19.974*
Total	61.113	43.683	57.360	41.455

The chief port of export for coffee is Sourabaya; in the Outer Districts Padang and Palembang.

Chief buyers are Holland and France, while lately a keener demand from the U. S. A. for the better qualities of Robusta and a few fancy coffees has been noticeable.

The chief markets for coffee are Batavia and Sourabaya, where a large forward business is carried on by the Chinese.

The quality must be West Indian preparation and must comply with the description fair average quality of the season at time of delivery.

Tea is for the East Indies as equally an important product as coffee.

This product is for the greater part grown in Java, but in late years large estates have also sprung up on Sumatra's East Coast.

The exports of tea during the last four years (in 1.000 K.G.) amounted to:

ORIGIN	1920	1921	1922	1923
Java and Madura	41.262	31.306	35.079	41.161
Outer Districts	5.009	4.557	6.473	7.148*
Total	46.271	35.863	41.552	48.309

* Preliminary figure.



PURA SANGSIT (ISLE OF BALI)

The Netherlands Indian tea enjoys a world wide reputation, which has enabled this industry to extend itself continuously.

The U. S. A. since the war, have shown a lively interest in Java tea and one can say, that the Java tea has secured a firm footing there.

The other large buyers are Australia, Great Britain and Holland.

Australia and the U.S.A. entering the market, has given Batavia a prominent place compared to formerly. Batavia is the teamarket for the Dutch East Indies.

The tea is marketed in the following qualities:

Orange Pecco, Pecco Souchon, Pecco, Broken Orange Pecco, Broken Pecco, Broken Tea, Fannings and Dust.

Sales are for full or half crops or also for special assortments.

The quality must be a fair average quality of brand and season, unless it has been sold on sample.

The quality of the tea is judged by the Tea Expert Bureau in Batavia, while the Tea Buyers Association is also established there, which looks after the interests of the buyers.

Fibre. Of the Netherlands East Indian fibres, the kapok has gained its greatest fame owing to its superior quality, consisting chiefly in the great elasticity, lightness and lasting resistance against moisture.

Kapok is used as filling material for matrasses and life belts, as isolator, etc.

The exports for the last four years (in 1.000 K. G.) amounted to:

ORIGIN	1920	1921	1922	1923
Java and Madura	12.194	17.585	15.131	12.727
Outer Districts	472	291	749	922
Total	12.666	17.876	15.880	13.649

The chief market, also port of export, for kapok is Samarang, from where in 1920, 1921 and 1922, 8.379, 11.215 and 9.661 tons were shipped.

The chief producing centre in the Outer Districts is Acheen.

Chief markets are U. S. A., Australia and Holland.

The Trading Association in Samarang fixes every year standard samples for Superior Java kapok, First quality Japara kapok and fair average Java kapok.

Sisal Fibre. In Java and also in Sumatra large estates have been opened lately and especially in Sumatra the soil and the climate seem to be especially favourable for the cultivation of this plant.

One large concern is the largest producer of sisal hemp.

Exports of sisal hemp during the last four years (in 1.000 K. G.) amounted to:

ORIGIN	1920	1921	1922	1923
Java and Madura	16.142	12.537	11.438	14.285
Outer Districts	—.—	1.794	7.623	11.397
Total	16.142	14.331	19.061	25.682

The U. S. A. and Holland are the chief buyers.

Cotton is especially exported ginned and unginned from the Outer Districts (Palembang) to Japan.

The exports from Java are of less importance. Samarang is the chief port of export.

Rattan. A jungle product, which is exported in large quantities, especially from the Outer Districts, is rattan.

The exports (in 1.000 K. G.) amounted to:

Rattan-Sticks.

ORIGIN	1920	1921	1922	1923
Java and Madura	—.—	18	—.—	—.—
Outer Districts	1.849	827	932	830
Total	1.849	845	932	830

Rattan

ORIGIN	1920	1921	1922	1923
Java and Madura	1.622	940	200	144
Outer Districts	53.704	33.854	40.153	41.239
Total	55.326	34.794	40.353	41.383

By far the largest quantity goes to Singapore, where nearly all the Borneo and Sumatra qualities and also several inferior Celebes qualities are cleansed and assorted.

After Singapore, the chief buyers are Hongkong, Germany and Great Britain.

Most of the rattan is gathered from plants growing in the jungle, but is also cultivated by the population, especially in Borneo.

Cinchona bark and Quinine. Cinchona bark is a most important product and the East Indies have succeeded in practically gaining a monopoly as regards the production for the world market.

The product is exported in large quantities as bark, the raw material.

But a large modern factory for the manufacture of the various quinine salts and preparations is established at Bandung in Java.

The exports of cinchona bark (in 1.000 K. G.) amounted to:

ORIGIN	1920	1921	1922	1923
Java and Madura	4.526	5.618	5.978	6.843
Outer Districts	109	172	200	211
Total	4.635	5.790	6.178	7.054

The exports of quinine from Java and Madura amounted to (in K.G.)

1920	1921	1922	1923
310.327	284.589	124.831	250.805

The Dutch East Indian bark is distinguished in two qualities, viz. factory bark of the Cinchona Ledgeriana and the pharmaceutical bark of the Cinchona Succirubra.

The first one is packed as dust in bales; the second in rolled pipes in cases.

The factory bark is sold by the Cinchona=Bureau under the clauses of the „Cinchona agreement" which for the time being has been extended until 1928.

According to this contract the manufacturers must take over from the producers the equivalent in bark of the quantity of quinine sold by them with a minimum of 300.000 K. G. per year.

The pharmaceutical bark chiefly goes to Holland, quinine chiefly to British India, Italy, Holland and Japan.

Pepper. Amongst the group of articles, important for the Dutch East Indies is that one of the spices and of these, pepper is the most important.

Tandjong Priok is the largest port of shipping, the exports however only refer to re=exports of the pepper, landed from the Outer Districts.

These large exports are in connection with the important pepper trade in Batavia.

The exports are mainly in the hands of a few large European export firms. A large forwarding business in pepper is done in Batavia, principally by Chinese.

The exports (in 1.000 K. G.) amounted to:

a. black pepper.

ORIGIN	1920	1921	1922	1923
Java and Madura	7.516	15.310	10.108	7.972
Outer Districts	5.787	6.659	16.077	11.538
Total	13.303	21.969	26.185	19.510

b. white pepper.

ORIGIN	1920	1921	1922	1923
Java and Madura	1.661	1.824	1.575	2.210
Outer Districts	4.197	5.790	5.292	5.070
Total	5.858	7.614	6.867	7.280



By courtesy of the Archaeological Service.

CHANDI DJABUNG. (RES. PASURUAN)

A few of the large European export firms have branches in the Lampong Districts and Palembang, where they buy the pepper direct from the producers.

The pepper from the Outer Districts goes principally to Singapore and Penang, the large pepper distribution centres in the East. It should be mentioned, however, that during 1922, large direct shipments were made from the Lampong Districts to the U. S. A.

Tapioca Products. This group of articles, which are prepared from the fecula of the cassave root, is the product of an important agricultural industry of recent date, which, in the D. E. I., only exists in Java.

Tapioca products are exported in various forms, of which the flour is the most important one; of minor importance are the other products such as flake and pearl; of the least importance are the dried tapioca roots and waste.

The exports (in 1.000 K. G.) amounted to:

	1920	1921	1922	1923
Flour	64.136	62.449	63.477	69.994
Flake	3.889	6.389	7.610	5.588
Pearl	7.354	10.477	9.903	12.149
Dried roots	117	1.105	8.795	22.691
Waste	248	633	930	1.011
	75.744	81.053	90.715	111.433

The chief ports of export are Sourabaya and Tandjong Priok, the chief destinations Great Britain and the U. S. A.

According to the manufacture, one distinguishes native flour and mill flour, the two of which are again subdivided in various varieties.

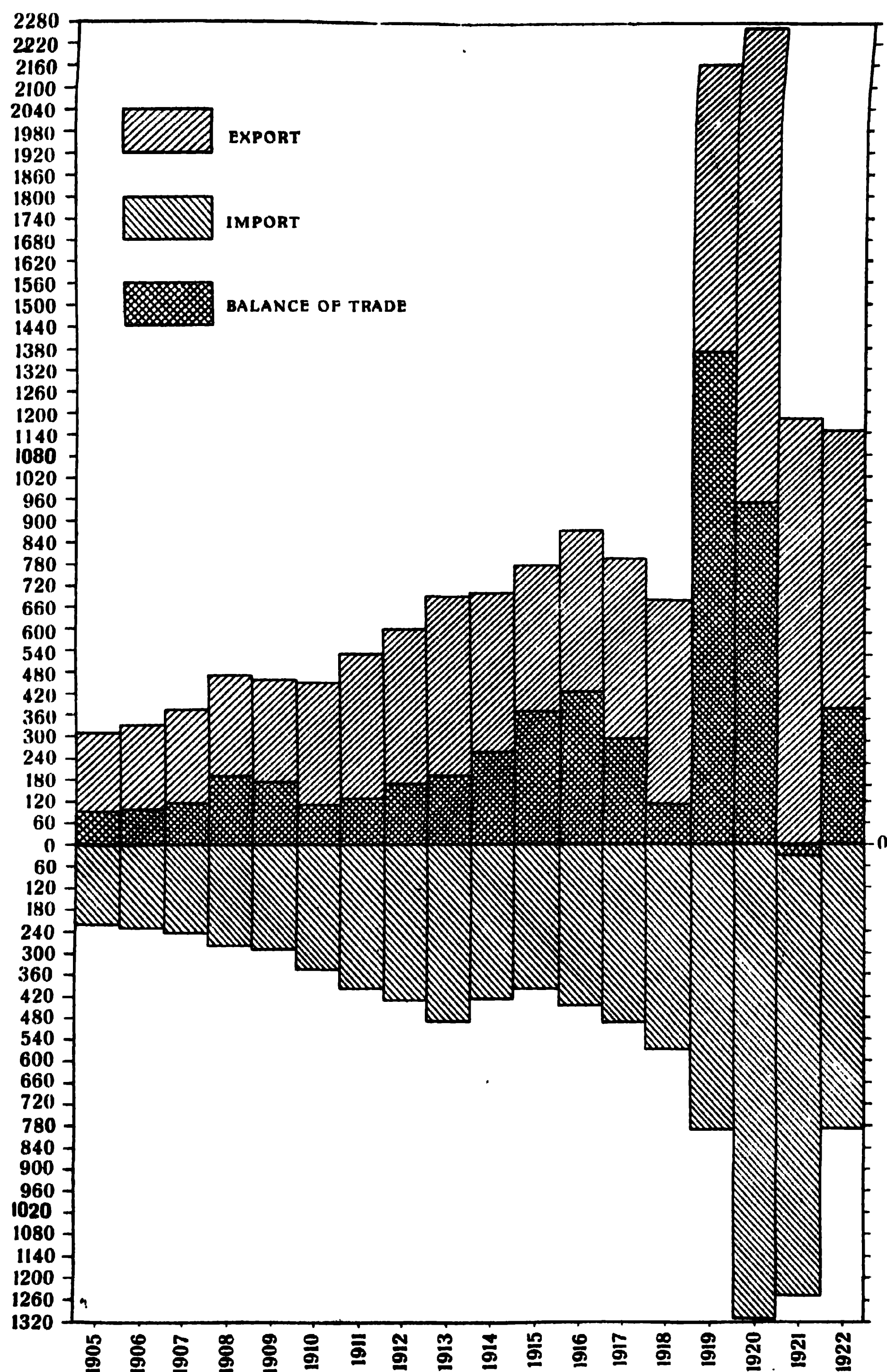
The Java flour, especially from the mills in East Java, has earned a reputation, due to its whiteness.

It is used for the dressing and finishing of textiles and, used as a starch, can, generally speaking, replace all other starches.

Cassava products can also serve as articles of food and as raw material for the manufacture of cheap alcohol.

There are further numerous Dutch East Indian export articles, worth mentioning for one reason or another.

Such for instance the *hats* which are plaited from bamboo and other fibres in the home industry by the native population in a couple of districts in West-Java and exported in millions to the U. S. A. and France.



EXPORTS, IMPORTS AND BALANCE OF TRADE
OF THE NETHERL. EAST INDIES

Further *mother of pearl and other shells,* which are found in the Eastern part of the Archipelago and are especially exported to Japan.

Hides are also large export articles and especially the light Java cow hides are very much in demand owing to the fine quality of upper leather, made from it.

Ebony, from Celebes and the Moluccas is one of the fine timbers, which are grown in large varieties in the Dutch East Indian forests, and have a ready demand on the world market.

Further *alcohol* and *arrack,* which are manufactured in large quantities in Java from the exhausted molasses of the sugar mills as raw material.

Gambir a tanning material of high quality, of which a large European estate exists in Sumatra.

Markets.

The import and export trade of the Dutch East Indies is chiefly con=centrated in five principal markets, viz. Batavia, Samarang and Sourabaya in Java, and Macassar in Celebes, Singapore, a British port, occupies a leading place especially as a market for the products of the Outer Districts such as Sumatra, Borneo and partly Celebes. In this connection rattan, pepper, gutta percha, copra, coffee and the small products, such as peanuts, damar, gambir and areca nuts, etc. should especially be mentioned.

Secondary markets are Medan, Padang and Palembang in Sumatra, and Menado in Celebes.

Sourabaya is the chief commercial city of the Dutch East Indies.

There the bulk of the chief product of Java, the sugar, is sold.

It is also an important market for coffee, tobacco and tapioca, while the Java hides are also chiefly sold there.

Samarang is an important sugar market and is the chief market for kapok.

Batavia is the chief market for tea, rubber, Lampong pepper and Banka tin; coffee, tapioca, gums and essential oils also sold in considerable quantities.

It goes without saying, that all other articles are sold on the three chief markets. Those mentioned are only the most important and typical ones for these markets.

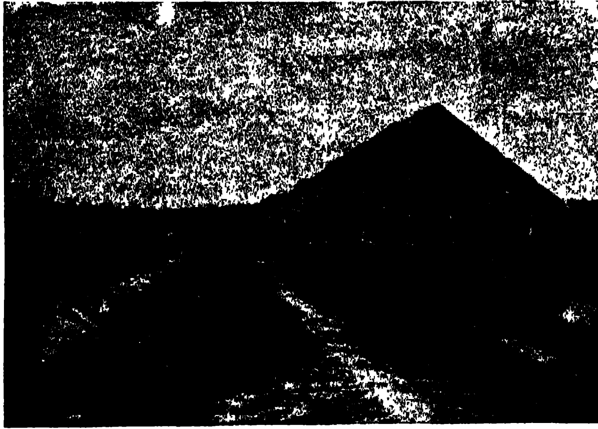
As import articles, rice, piece goods, machinery and manure are the most important ones for Sourabaya; piece goods and manure for Samarang.

Batavia has no typical import article.

Macassar is the chief market for copra, rattan, shells and birdskins and part of the Celebes coffee, maize, gums and resin. Generally speaking Macassar is the commercial centre and the port of distribution of Celebes and the Moluccas.

Medan is the capital of Sumatra's East Coast and there the head=offices or agencies of the large tobacco, rubber, tea, palmoil, fibre estates are established.

Padang is especially important as a market for the Sumatra fancy coffees; Palembang on the other hand as a market for the Palembang robusta coffee, pepper, rattan and native rubber. Menado is only of importance as a market for copra and a few varieties of Celebes fancy coffees. The produce of Borneo is chiefly sold in Macassar, Sourabaya and Singapore; the chief commercial centres on the Island however are Bandjermasin and Pontianak.



TOBACCO-SHED

PATENTS.

The Dutch East Indies with Holland, Surinam and Curaçao forms one patentdistrict, for which the patents are issued by the Patent Office at the Hague. The applications are sent in to the Patent office at the Hague, but residents of the Dutch East Indies may send them in at the Branch Office of Industrial Property at Batavia, ranging under the Department of Agriculture, Industry and Commerce. The date of application there, stands for the dating and numbering of the application, so that by making application in Batavia the loss of time is eliminated, which otherwise would be incurred in sending the documents directly to the Hague.

Furthermore the Branch Office gives its assistance in drawing up the documents, so that the documents reach the Patent Office in the correct form.

The granted patents are valid for 15 years. An annual tax must be paid rising in periods of three years from sixty to one hundred fourty guilders.

Furthermore the Branch Office gives all information with regard to Dutch patents, also about present or previously existing patents, but which have since elapsed. One and the other may be of service to those, who contemplate establishing a commercial or industrial concern in the D. E. I., to whose interest it is to know, which existing patents have to be respected and which formerly patented working methods and machines they may use.

TRADE MARKS.

Trade Marks may be registered with the Branch Office of Industrial Property. The fees amount to thirty guilders per mark. The registration

is valid for twenty years and lapses automatically if they have not been renewed beforehand. The registration gives a legal presumption as to first use, in the case of a process, thus relieving the registered holder of the obligation to prove his rights to the trade mark. This obligation, however comes into force again, if the opponent establishes that he used the mark in question, or a resembling one, before the date of registration. The legal presumption and consequently the exemption of the burden of proof (onus probandi) expires three years after the last time, the registered mark has been used.

It deserves recommendation for those who intend to establish a commercial concern or factory in the D. E. I. for importing articles, to have their trade marks registered in their own name, immediately from the start. Foreigners require for this the support of a resident of the D. E. I., which however, as experience has proved, is easily obtained.

The Branch Office of Industrial Property also gives the necessary information with regard to the protection of trade marks.



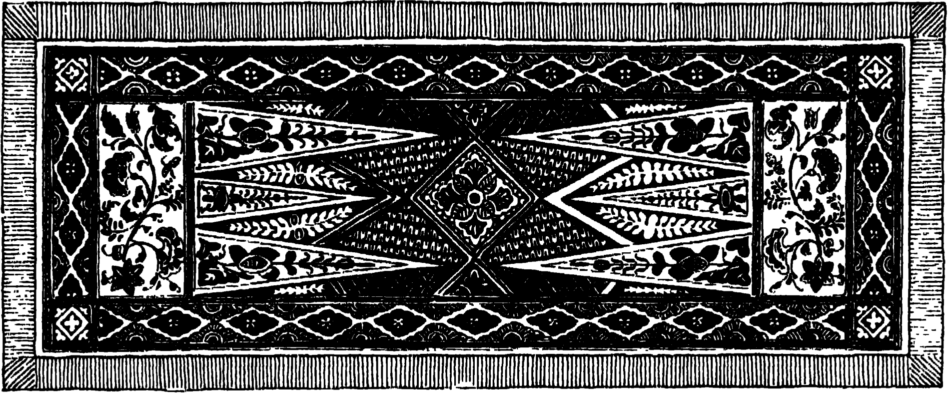
MEANS OF COMMUNICATION.

Roads.

Railways and Tramways.

Postal, Telegraph and Telephone Service.

The Waterpower and Electrical Service.



CHAPTER XII.

ROADS.



he construction and the upkeep of the roads in such an extensive territory as the Dutch East Indies, which, except for some agricultural centres, is practically at the beginning of its economic development and where the railway system can only be gradually extended, is of the greatest importance. The Government for this reason has always paid special attention to this item, and though numerous excellent roads have been constructed on the various islands, sometimes even right across the mountains, the extension of the road system is constantly being increased.

The attention of the Government is at present all the more needed, since, owing to the use of motor cars, for passengers as well as for goods traffic, the roads in this colony have so much more to endure.

Since 1905 the management of the roads rests no longer exclusively with the Government; during that year the decentralization was introduced in the form of an institution of local resorts with their own monetary means.

The upkeep and eventual extension of the road system, situated in these districts, were thereby transferred to the relative Councils, which were enabled thereto by receiving payment of the necessary funds from the Government, either in the form of a yearly fixed payment or incidentally by way of subsidies.

The economical progress of country and population, as well as the development of the traffic, which are very closely connected with one another, made it necessary to follow a more systematical plan for an extension of the existing road systems, which had proved to be necessary in the course of time.

The technical side of the road question has since also come more to the fore.



NAT ;AMBOO BRIDG

For Java, Sumatra, Borneo and Celebes various plans for roads have been projected and have partly been carried out already.

With these plans due consideration is given in the first place to the necessary linking up of already existing roads, while furthermore they include the connections, which are intended to open up more remote districts for the general traffic. Naturally efforts are made to connect with rivers, which, if necessary, are made navigable.

A survey of the above mentioned plans for roads and the expenses connected with these, as far as they can be estimated at the present moment, are given below, in order to be able to give an idea of the considerable amounts, which are at stake for this part of the care of the public services.

For Java a general road plan was fixed in the first place (in 1912), which mainly consisted of a Northern and Southern main road, crossing the island in a longitudinal direction, following, for the greater part, the well known main road of Daendels, and also six cross roads running between the two main roads mentioned before.

The costs of this plan can now be estimated at about glds. 8.500.000.—, of which at the end of 1922 about half the amount, namely about glds. 4.300.000 has been spent.

In connection with the general road plan, local road plans have been made up for the decentralised districts in Java, the costs of which can be estimated at about 35 million guilders. The Government has spent up to the end of 1921 glds. 9.700.000 for the construction of these catagories of roads.

Since 1914 there exists a general road plan for the island of Sumatra, which, in view of the greater difficulties which were experienced in this district, owing to the soil conditions and the scanty population, was not carried out further, except for the linking up of the more important population or estate centres inland with the harbours, or connecting stations along navigable rivers, while care was also taken to establish the interdistricts connections, which were rather important from a political point of view. The costs of construction and improvement of the roads, belonging to this plan, can be estimated at about 60 million guilders, of which already 24 million have been spent up to the end of 1922.

Besides this general plan, the construction of several connecting roads is being considered, which would entail an expenditure of glds. 12.000.000.— Only a small part of this amount has been spent so far.

For the two districts, viz. the Western and the Southern and Eastern District of Borneo, road plans have been compiled, which, for the time being, are only limited to the construction and improvement of roads in those districts, which have mostly developed.

The estimates of these plans amount to respectively 20 million and about 11½ million guilders. As the construction of the relative links was only commenced in late years, so far only glds. 1.000.000.— have been spent and especially in the Southern and Eastern District of Borneo.



POND

On the Island of Celebes a road plan has been fixed for the Minahassa in the Residency of Menado, which has already partly been executed and completed. The costs of this plan can be estimated at about 5 million guilders, of which so far about glds. 800.000.— have been spent till the end of 1922.

In South Celebes the improvement and construction of some main roads are being executed, for which an expenditure of about 5½ million guilders will be necessary. Half this amount has been spent so far.

In connection with the details mentioned above, here follows a statement of expenditure during the last three years on roads, bridges, and other works by the Public Works Service of the Dutch East Indies, from which the growing importance of the road problem may appear.

a. Direct Government expenditure:

	UPKEEP AND REPAIRS	RENEWALS AND NEW WORKS
in 1920	glds. 3.441.000	glds. 8.563.000
1921	,, 3.816.000	,, 8.458.000
1922	,, 3.098.000	,, 3.316.000

b. Expenditure by local councils with own means:

	ACCORDING TO LOCAL ESTIMATES OF EXPENDITURE FOR ROADS, BRIDGES AND FERRIES
in 1920	glds. 13.211.000.—
1921	,, 14.902.000.—
1922	(no complete details available).

The figures mentioned in the tables are rounded off in thousands.

The low amount of direct government expenditure spent on renewals and new works in 1922 is the result of the strict economies, which were found necessary since that year.

The amounts mentioned in table *b* include the fixed yearly payments, made by the Government to the local councils, while they also include the special Government subsidies, which, for the years mentioned above, amounted to respectively glds. 3.441.000.— and glds. 3.059.000.—.



CLEANING OF SISAL HEMP

RAILWAYS AND TRAMWAYS.

Of the islands of the Dutch East Indian Archipelago, Java (with Madura) has the most extensive railway and tramway system viz. 5.339 K. M.; Sumatra follows with 1.531 K.M. and Celebes closes with a tram line of 47 K.M. length.

In Java and Sumatra, part of the railways are run by the Government and another part by private companies; the tramway in Celebes is run by the Government.

Java.

The dense population, the great number of estates and industrial concerns and also the presence of ports with modern appliances, accessible to ocean steamers with heavy draught, are for this island the factors, which have caused the speedy development of the railroad traffic.

For the through passenger traffic between East, Central and West Java express and fast trains with mail type bogie passenger carriages and dining car are daily running over two routes, a mountain route, offering beautiful scenery and a shorter route over the plains, but less interesting from a scenic point of view.

For passenger traffic on short distances ordinary passenger and mixed trains are running.

Goods are transported by mixed and goods trains.

The chief traffic centres in Java are the coastal towns Batavia and Sourabaya, which now have modern ocean harbours, through which passes the bulk of the import and export trade, and Samarang. Of less importance are Tjilatjap, Djocjakarta and Bandung.

The length of the State Railways in Java at the end of 1922 amounted to 2.839 K. M., of which 2.719 K. M. with the usual Java gauge of 1.067 M. and 120 K. M. narrow gauge railways with a width of 0.60 M.

14 Private Companies are working:

266 K.M.	with a gauge of 1.435 M.
2.184 "	" " " " 1.067 "
32 "	" " " " 1.188 "
18 "	" " " " 0.70 "
Total 2.500 K.M.	

Of these concerns the Netherlands Indian Railway Company is about the leading one, operating 210 K.M. railway and 602 K. M. tramway lines.

For some of the districts, where the construction of a railway or tramway line would be too costly, motor car services have been established.



THE LOOK-OUT AND OLD HARBOUR AT BATAVIA

Such services are run by the Government in the Preanger Regencies over a distance of 105 K.M. and in the Residency of Cheribon over a distance of 51 K.M., totally 156 K.M.

The following table gives an approximate survey of the receipts of the passenger and goods traffic during 1922.

RECEIPTS IN GUILDERS.

	PASSENGERS WITH LUGGAGE	GOODS	MISCELLANEOUS	TOTAL
State Railways and Tramways	27.103.189	31.405.946	5.625.698	64.134.833
Netherlands Indian Railway Coy.	5.685.441	11.819.016	443.456	17.947.913
Other Companies	10.164.602	9.742.128	593.535	20.500.265
Total	42.953.232	52.967.090	6.662.689	102.583.011

The largest percentage of the goods traffic is earned from agricultural products and sugar in the first place.

The total working expenses during the same year were:

for the State Railways and Tramways in Java	glds. 57.446.562
Netherlands Indian Railway Coy.	" 12.634.000
Other companies	" 12.648.137

The receipts of the Government motor car service in Java amounted in 1922 to glds. 259.994.—, while the running expenses amounted to glds. 293.219.

The total capital expenditure on all Government lines in operation on Java is glds. 378.357.844.—.

For the Netherlands Indian Railway Coy. this amounts to glds. 99.908.153.— and for the other companies to glds. 107.570.381.—.

Owing to the curtailment of the construction programme by the necessity for reduction of expenditure, the construction of new lines in Java has been postponed.

Only the tramway line Kopo=Tji Widej in the Preanger Regencies, which was already under construction, is being finished.

The schemes for the electrification of the various State Railway Lines have been cut down owing to the stress of time, so that they are only working on the electrification of the lines in and around Batavia.

Sumatra.

Here we distinguish three districts where railways were constructed viz. South Sumatra, Central Sumatra and North Sumatra.

These three systems are not yet linked up, though plans for this have already been prepared, but the execution has been postponed for the time being until better times have arrived.

South Sumatra.

In South Sumatra the Government is working 323 K.M. of tramway line, running through the Residencies Lampong Districts and Palembang.

At the end of the year a section of 28 K.M. was nearly completed. Important traffic centres are Palembang, about 90 K.M. from the coast, but still accessible to ocean steamers, and Telok Betong.

Near Muara Enim we find the Bukit Asem coal mines, worked by the Government, the whole production of which is carried to Palembang by tram line and shipped from there.

In 1922 the output was 104.410 tons.

In the Residencies Palembang and Benkulen, the Government runs motor car services over a distance of 1.194 K.M.

Central Sumatra.

In the Residency Sumatra's West Coast the Government operates 258 K.M. of railway lines. The chief traffic centre here is Padang, which town has a suitable port, accessible to large ocean steamers. Originally this line was constructed for the transportation of the coal from the Ombilin Coal Mines.

463.794 tons of coal were shipped in 1922.

The construction of 26 K.M. of railway track is still in progress.

On Sumatra's West Coast the Government operated motor car services over various distances with a total of 945 K.M.

North Sumatra.

Along the East Coast of Acheen from Sumatra's most Northern point, runs the Acheen Tramway owned by theStatefor a length of 511 K. M., with as chief traffic centre Kota Raja, to Pangkalan Susu on the Aru Bay Near the terminus at Besitang, this line links up with the Deli Railway Company. This Company operates in the Government of Sumatra's East Coast, 271 K.M. of railway track and 168 K.M. of tramline. The chief traffic centre here is Medan with the port of Belawan The track of the Deli Railway Company reaches in the North Pangkalan Susu, in the South Tandjong Balei with Telok Nibung, and in the West Pematang Siantar.

PRODUCTION OF SAGO

In the following table a survey is given of the receipts of the passengers and goods traffic during 1922:

RECEIPTS IN GUILDERS.

	PASSENGERS INCLUDING LUGGAGE	GOODS	MISCELLANEOUS	TOTAL
State Railways and Tramways	2.857.786	4.906.457	1.163.282	8.927.525
Deli Railway Company	2.422.543	4.666.569	391.648	7.480.760
Government Motor Car Service	496.423	675.992	31.911	1.204.326

The total running expenses for 1922 amounted to:

State Railways in Sumatra	glds. 7.753.514
Deli Railway Company	„ 4.512.891
Government Motor Car Service	„ 1.515.060

The total capital expenditure on all the State Lines in Sumatra at the end of 1922 amounted to glds. 86.753.564.—.

For the Deli Railway Company this figure came to glds. 47.886.640.—.

The gauge of all the railway- and tramlines in Sumatra is 1.067 M. except the Acheen Tram, which has a smaller gauge (0.75 M).

Celebes.

On the first of July 1922, the first tramline on this island (Macassar-Takalar 47 K.M. long) was opened for traffic.

During the last six months of 1922 the receipts amounted to:

passengers and luggage	glds. 68.186
goods	„ 8.403
miscellaneous	„ 2.657
Total	glds. 79.246

The running expenses for the same period came to glds. 107.809. The capital expenditure up to the end of 1922 amounted to glds. 4.189.612.

The gauge in Celebes is 1.067 M.

POSTAL, TELEGRAPH AND TELEPHONE SERVICE.

Postal Service. In practically all places of some importance in the Dutch East Indies post offices are established, whilst in numerous smaller places branch offices of a modest character enable the public to do their postal business.

The conveyance of mails by land is arranged by the State and private railways and tramways, motor cars, vans and carriers and along the rivers by launches and by post prahoes.

Oversea there is a regular service between the various islands, chiefly by the fleet of the Royal Packet Navigation Company, and moreover steamers of other steamship companies.

There is a weekly service to Europe by the mail steamers of the Steamship Companies „Nederland" and „Rotterdam Lloyd". The mail from Java to Holland or vice versa takes about four weeks under ordinary circumstances.

The mails adressed to other foreign countries for so far they are not conveyed exclusively by the mail steamers of the above mentioned two Dutch Companies via Egypt and Europe, are forwarded via specially appointed exchange offices by the most speedy means to their destination.

To promote greater facilities for the direct exchange of parcels and money orders, special agreements have been instituted between the postal administration of the D. E. I. and those of the most neighbouring countries, which are not signatory to the universal parcelpost convention and the universal money order convention of Madrid.



MANUFACTURE OF COPRA

From the following data in connection with the postal service during the years 1911 and 1922 an idea may be formed of the stupendous increase during these 12 years.

The number of post offices, branch offices and railway post offices amounted to 364 in 1911 against 581 in 1922.

The postal service sorted 45.533.672.— letters etc. in 1911, against 81.316.550.— in 1922.

An amount of glds. 2.525.558.— was received for postal stamps in 1911 against glds. 8.234.765.— in 1922 and an amount of glds. 1.959.870.— in revenue stamps in 1911 against glds. 11.054.709.— in 1922.

The number of inland ordinary and telegraphic post office money orders amounted to 748.253.— in 1911, against 1.756.410 in 1922 with a monetary value of respectively glds. 26.647.373 and glds. 91.786.473.—.

The number of foreign ordinary and telegraphic post office money orders, sent and received in 1911 was 88.410 against 105.816 in 1922 with a monetary value of respectively glds. 3.110.605.— and glds. 6.066.832.—.

The number of inland postal parcels amounted to 350.659 in 1911 against 811.212.— in 1922, foreign parcels were respectively 163.468.— and 243.198.—.

In 1911 159.361 insured and 146.569 C. O. D. inland matter were dealt with. The monetary value of these was glds. 41.668.513.— and glds.

2.093.212.—. In 1922 these figures were respectively 330.103.— and 516.334.—, the monetary value respectively glds. 94.235.479.— and glds. 17.867.839 —.

The number of foreign insured and C.O.D. matter in 1911 amounted to 12.206 and 41.418 with a monetary value of respectively glds. 1.094.176.— and glds. 931.459.—. In 1922 the figures were respectively 72.011 and 51.241 and the monetary value glds. 10.639.605.— and glds. 1.615.998.—.

The Telegraph Service. While the principal islands are connected with one another by sub=marine cables and wireless stations, the most important places on these islands are connected to the telegraph system by telegraph lines.

The length of the sub=marine cables is 12.600 K.M; the one of the overland lines at the end of 1922 was about 11.350 K.M. with a wire length of about 31.300 K.M.

Furthermore the Dutch East Indies are connected with the foreign cable service by some cables via Penang, Singapore, the Cocos Islands and Port Darwin and also by the cable via Yap, which has been put out of operation since 1914.

The number of Government wireless stations amounts to 13, of which 5 are reserved for ships' use, while the big power station at Bandung is reserved for the direct service with Holland and abroad.

Furthermore there are a few military and six private stations, of which a few are entirely or partly open to the public.

Together with the extension of the system and the cables and lines, the number of main and local telegraph offices has steadily increased to 857 in 1922.

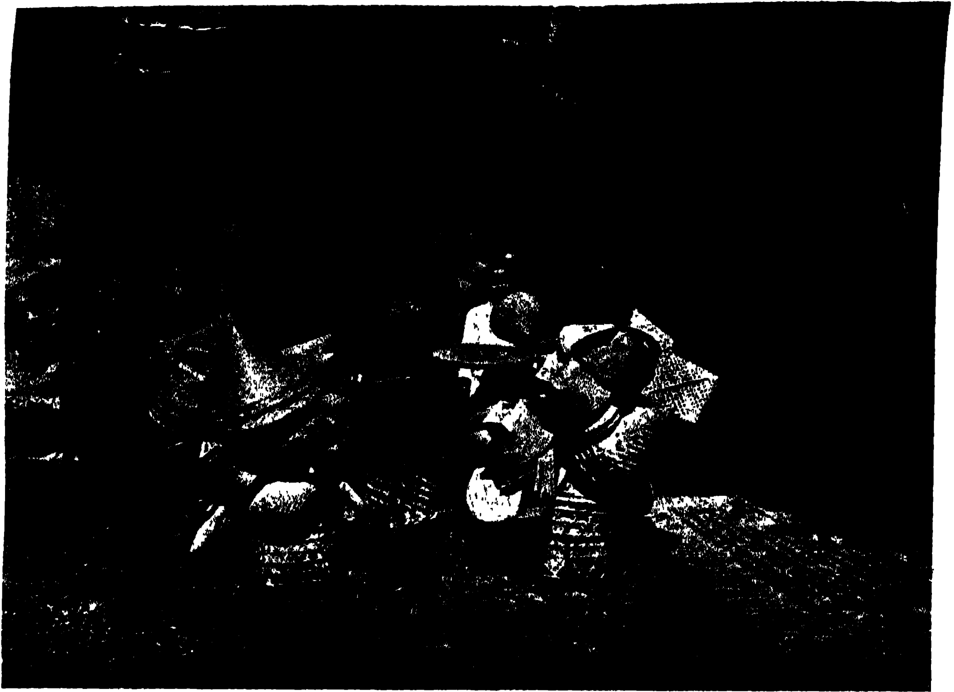
These include 204 offices of the private railway companies and the Civil Service, which only cater for the local service; all the other offices are fully equipped for the foreign service.

During 1922, 1.430.531 local telegrams were sent, while a total of 663.050 foreign telegrams were sent and received.

Besides telephone and Morse apparatusses, also recorders and modern rapid telegraph apparatusses are used.

The Telephone Service. The development of the telephone service dates back to 1883, when some private companies started to establish telephone systems in the principal commercial cities of Java, viz. Batavia, Sourabaya and Samarang. Gradually the number of companies increased and in 1898 the number of telephone systems amounted already to 35.

The ever=increasing trade caused a demand for means of communication, more practical than the telegraph. Again the private concerns were the first to establish a Long Distance Telephone Company. Although several difficul=ties had to be met, the financial struggle being the greatest, a Long Distance communication between Batavia, Samarang and Sourabaya was established in 1897.



SELLER OF BASKET-WORK

As the different owners of the telephone systems looked more after their own interests than after those of the public, the subscribers felt the disadvantage. The smaller companies, not working with big capitals could not keep up with the tremendous growth of the technical developments of the last few years.

The Government, seeing that only a proper and rigorous working of the regularly growing telephone service would be to the public's benefit, resolved to take over the Telephone Service and the result was a doubling of both telephone connections and traffic, during the last few years. Up till now, nearly all places in Java and Madura have telephone communications enabling conversations by the long distance telephone, of 1.000 K. M. and over.

The rates fixed in 1913 and increased with 50% in 1918 during the European war, are approximately the same as charged in other parts of the world, notwithstanding the high price of materials to be bought in Europe as well as in America. For big cities as Batavia, Sourabaya, Bandung and Samarang the fee for the first installation amounts to glds. 15—. whilst the monthly subscription rate is glds. 15.—. In smaller places the subscription fee is glds. 12.— on Java and glds. 15.— on the other islands.

Nearly every estate, be it ever so far from a commercial centre, has a telephone communication, which is established by the Government at a reasonable contribution towards the installation expenses.

The following compendium about the progress of the telephone service

from 1914 to 1922 will give the decisive proof of the results, which centralisation of Telephone Systems has had in the Dutch East Indies.

	LENGTH OF WIRES IN K M.	NUMBER OF TELEPHONE OFFICES	TELEPHONE APPARATUSSES	NUMBER OF LONG DISTANCE CALLS	GROSS RECEIPTS FROM THE SERVICE	WORKING EXPENSES	NET PROFIT AFTER DEDUCTION OF INTEREST AND DEPRECIATION
1914	85.488	148	14.093	282.506	glds. 2.211.874	glds. 1.293.440	glds 309.207
1919	140.982	228	28.811	969.743	„ 5.695.141	„ 5.138.167	„ 556.973
1920	152.354	251	32.201	1.214.862	„ 7.966.036	„ 7.921.545	„ 444.908
1922	162.368	277	34.936	1.389.400	„ 10.180.152	„ 9.703.042	„ 477.110

The Staff. The bulk of the staff of the postal, telegraph and telephone service is recruited locally.

During a few years it was even necessary for the performance of the more simple surveyors work and even for the ordinary routine work to get personnel from Holland, but during late years, thanks to the increase of the trade schools in the Dutch East Indies and by putting more local men on the staff, the sending out of men from Holland could be restricted to those for the leading positions and technical experts. The sending out of these men has gradually diminished and is practically at a standstill at the present moment.

Where the number of officials and clerks in the postal, telegraph and telephone service amounted to 1586 in the beginning of 1898, it had risen to 11.286 on January 1st 1923. In a period of 25 years the personnel increased eightfold.

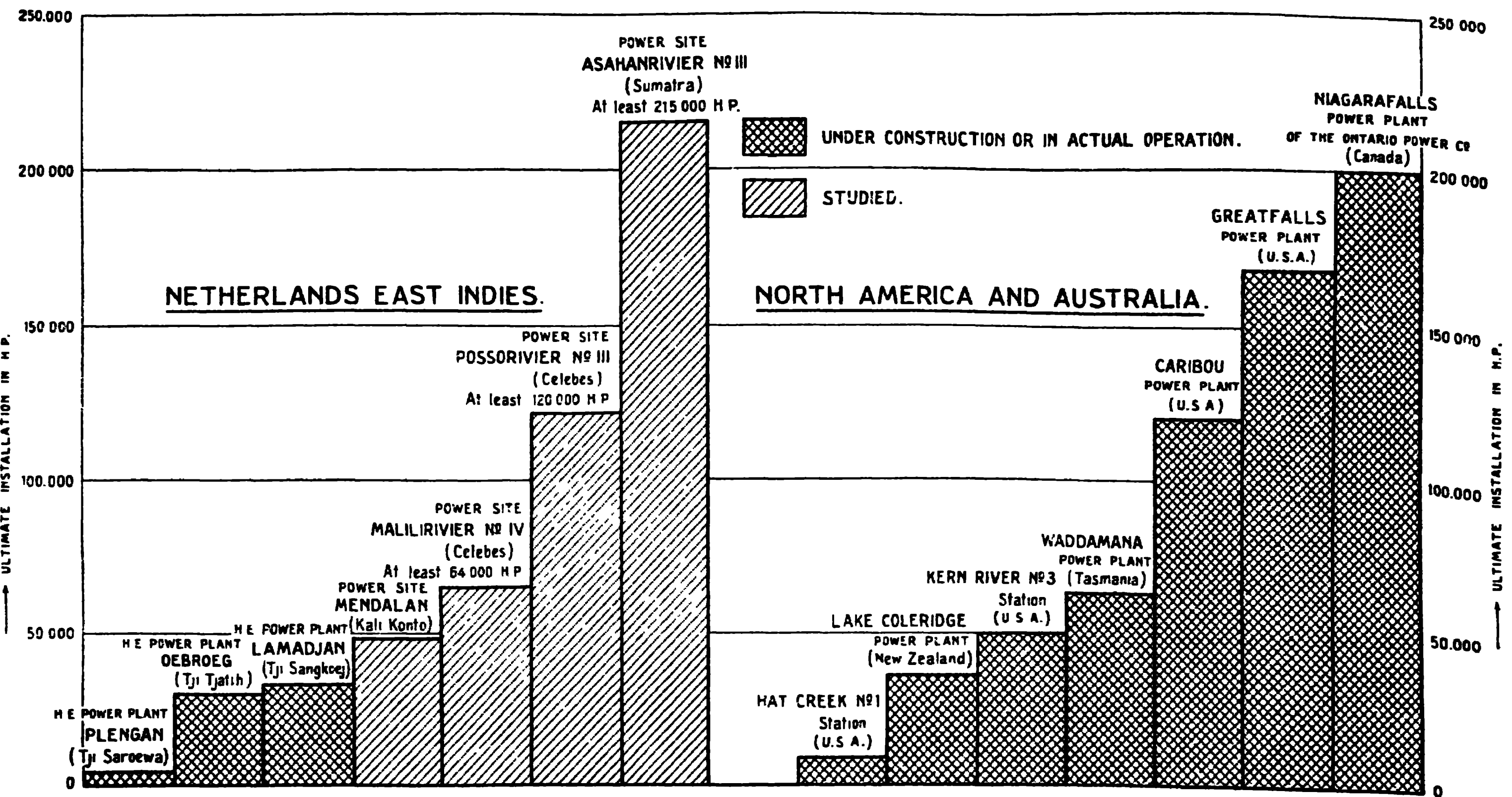
THE WATERPOWER AND ELECTRICAL SERVICE.

Since 1910 the waterpower problem for the D.E.I. has had the attention of the Government, in the beginning only with a view to the future electrification of the State Railways, later on, in a broader sense, in the interest of a better supply of energy as a chief factor for the industrial development.

The Service for Waterpower and Electricity, which was created in August 1917, is an independent section of the Department of Government Services. This new section has been given the task to promote a supply of economical energy for the territories, which are in want of it, to make a proper use of the country's waterpower and to give every assistance, not only in the interest of the industrial development of these districts in general, but also for the benefit of the State Railways and other Government services.

To fulfil this task the following measures were taken:

1. The building of State waterpower works, not only for industries and services already existing, but also for supply of electrical power in general.



CAPACITY OF SOME WATERPOWER PLANTS IN THE NETHERLANDS EAST INDIES IN COMPARISON WITH THE CAPACITY OF SOME WATERPOWER STATIONS IN THE U. S. A. AND AUSTRALIA.

2. State exploitation of power stations and participation of the State in other electrical industries for the distribution of the energy.
3. The establishment of a waterpower cadastre to give expert advice to interested parties regarding watersurveys, waterpower wells and concessions.
4. Revision of the waterpower and electricity regulation.


COLLECTING OF GUM DAMAR

To divide the above mentioned task in a practical way, the service possesses, besides an administrative, three technical sections, viz. the hydrotechnical, the electrotechnical and the building section, which are all established at Bandung. *The hydrotechnical Section* includes the following operations:

a. Research for and the making of an inventory of waterpower. On the whole the natural conditions for the exploitation of waterpower in the D. E. I., may be considered favourable; as especially favourable factors should be mentioned: the large annual rainfall, the appearance of large lakes, suitable for accumulation, — especially in the Outer Districts,— large falls owing to the mountainous nature of most of the islands and the absence of a winter season with, as a consequence, the elimination of the drawbacks of snow and ice.

On the other hand the unfavourable circumstances are: the prevailance of a characteristic dry season (east monsoon), the rarity of good solid rock bottom and, as a consequence of this, the mostly necessary long survey for the pipelines.

According to a rough estimate, whereby, for a large part, the still unknown, but probably in waterpower very rich New Guinea is not included, in the D.E.I. 5½ million H. P. are exploitable for works of more than 1.000 H.P. This capacity is divided as follows over the various islands:

Java	500.000 H. P.
Sumatra	2.000.000 ,,
Celebes	1.000.000 ,,
Borneo	2.000.000 ,,
Total	5.500.000 H. P.

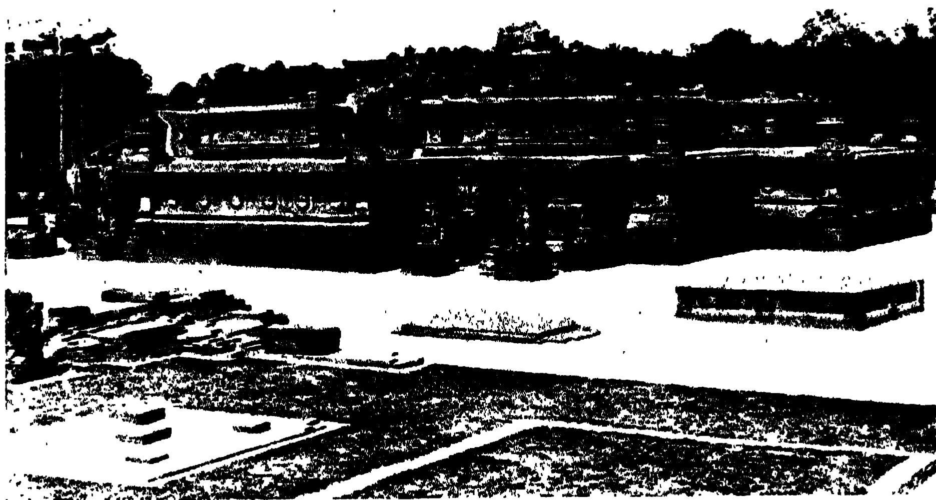
Survey of waterpowers exploited and exploitable at the end of 1922:

JAVA

		Power in H.P. Minimum in dry season	Power in H.P. Average in 9 months
Surveyed but probably not exploitable		240.000	410.000
Not further surveyed, economically exploitable powers of more than 500 H.P. average capacity		400.000	690.000
Examined by the Government of which	completely surveyed, planned and estimated	83.300	153.500
	under construction	9.900	22.100
	constructed and working	3.700	7.150
Granted the concession of which	construction not yet started	4.880	9.950
	under construction	3.720	6.580
	constructed and working	3.910	5.420
Used according to permits until further notice		10.000	13.700

OUTER DISTRICTS.

		Power in H.P. Minimum in dry season	Power in H.P. Average in 9 months
Surveyed but probably not economically exploitable		—.—	—.—
Not further surveyed, economically exploitable powers of more than 1.000 H.P. average capacity		1.858.000	2.852.000
Examined by the Government of which	completely surveyed, planned and estimated	530.000	727.000
	under construction	—.—	—.—
	constructed and working	2.000	2.000
Granted the concession of which	construction not yet started	219.000	316.000
	under construction	—.—	—.—
	constructed and working	3.800	5.450
Used according to permits until further notice		6.500	6.500



CHANDI PANATARAN. (RES. KEDIRI)

The energy exploited by the Government is divided over the following power stations (at the end of 1922).

NAME OF THE POWER-STATION	PURPOSE	INSTALLED ENERGY IN H. P.	9 MONTHLY POWER OF THE WORKS IN H. P.
Java.			
1. Tji Geureuh I	Supply of current to the Radio Station Malabar	200	200
2. „ „ II		350	350
3. Plengan	Energy supply of Bandung and vicinity and Malabar Radiostation	4.500	2.300
4. Bengkok		4.500	3.000
5. Giringan	Energy supply to railway workshops and illumination of Madiun	2.000	2.000
	Total *Java*		7.850
Sumatra			
1. Teis	Energy supply to State and private gold-mines	2.000	2.000
	Total *Java* and *Sumatra*		9.850

At the end of 1922 the following power-stations were under construction:

NAME OF THE POWER-STATION	PURPOSE	ENERGY TO BE INSTALLED IN H P.	9 MONTHLY ENERGY OF THE WORKS IN H.P.
Java.			
1. Kratjak	Electrification in and around Batavia,	24.000	8.000
2. Ubrug	general energy supply for various places	21.500	7.500
3. Dago	Energy supply in Bandung and surroundings and Ma-labar radio station	1.000	900
4. Lamadjan		27.000	10.000
	Total *Java*		26.400

Of all the powers mentioned above — those already in use as well as those not yet used or given in concession — the principal details as to situation, capacity, (drop and output), existing topographical surveys, accumulation possibilities etc, are systematically registered in the *waterpower cadastre.*

This waterpower cadastre is accessible to the public; private individuals who wish to use waterpower, can get information free of charge as to what is known already about the appearance of the power energy in rivers, or irrigation-canals suitable for their purposes. If necessary the available hydrographical and topographical data can be supplied against a small remuneration.

b. Water surveys.

At the end of 1922 there were in all 72 watersurvey stations.
These are spread as follows over the various districts:

1. In Java 55, of which 29 are provided with self registering instruments;
2. In Sumatra 10, of which 3 have self registering instruments;
3. In Celebes 7, of which 4 are fitted out with self registering instruments.

By regular daily gauges of the waterlevel and periodical gauges of the discharge by means of hydrometrical mills and by a chemical system (in 1922 311 gauges were made in all), the daily output is fixed at these stations. The results of these gauges are published yearly in bookform.



MAKERS OF BATIK=STAMPS

c. Preliminary plans and estimates of cost.

For the waterpower works to be built by the Government for the general electrical supply and for certain Government enterprises, the necessary detailed plans, estimates and calculations of productiveness are made. At the end of 1922 of such plans were in hand:

The supply of energy for Sourabaya by means of waterpower from the river Konto (capacity: 11.500 H.P. constant power) and the extension of the supply of energy by the Bandung Highland, by increasing the existing reser= voirs and powerstations of the Tji Sangkoej.

Similar preliminary plans are, if needed, also worked out for Provinces or Boroughs, and in special cases even for private concerns.

d. Handling of applications for waterpower concessions.

All applications for the granting of waterrights are examined, and a report submitted to the bodies who must grant these rights.

In the D. E. Indies there are 2 kinds of permits for the use of waterpower.

a. permits until further notice for power below 100 theoretical H.P., exclusively for own use, and

b. permits for a duration of 40 years for power of more than 100 H. P. theoretical power, intended also for supply of energy to others. The first men= tioned permits are exempted from payment; for the latter permits (concessions) a yearly watertax is charged amounting to:



FISHING-VILLAGE IN THE OUTER DISTRICTS

glds 2.— per theoretical H.P. for the first 900 H.P. above 100;
„ 1.50 „ „ „ „ „ following 9.000 H.P.;
„ 1.— „ „ „ „ „ power above 10.000 H.P.

Applicants for permits, if they desire so, are supplied with all available details regarding the appearance of suitable sources of energy and information on the construction.

The quantity of economically exploitable power known is mentioned before. The size of these various sources of energy to be used in a single work, compared to those of foreign works, may be seen from the diagram, printed above.

The Electrotechnical Section has the task of studying and working out plans for the mechanical and electrical installations of new steam and waterpower works and to extend existing power-stations, which are under the Department of Government Services.

Furthermore this section gives advice to other Government institutions, and especially to local resorts, regarding matters belonging to their sphere of activity.

It exercises, according to the principles accepted by the Government, the „electricity politics", which must lead to an electricity supply as rational as possible of the territory of the D.E.I. In connection with this, it deals with all applications received for the construction of local electric works, and supervises the execution of the permits granted.

Electrical problems of general interest are studied up, among which must be mentioned the making up of regulations, the promotion of normalization, and the collection and working out of statistical details.

At the beginning of 1923 the total of the generatorpower of 105.200 K.W. installed in the D.E.I. was divided as follows:

	WATERPOWER	CALORIC CENTRALS	TOTAL
Public Electrical Works	2.400 K.W.	22.800 K.W.	25.200 K.W.
Government enterprises	8.600 „	17.200 „	25.800 „
Private industries	8.400 „	45.800 „	54.200 „
Total	19.400 K.W.	85.800 K.W.	105.200 K.W.

In all there are in the D.E.I. 20 cities in possession of public electric works.

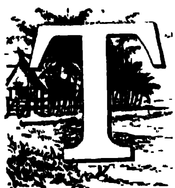


DUTCH EAST INDIAN PORTS.



CHAPTER XIII.

DUTCH EAST INDIAN PORTS.



he necessity of an improvement and modernization of the principal ports in the Dutch East Indies was urgently felt fifteen years ago, owing to the rapid strides, shipping had made during late years. In connection herewith the Netherlands Indian Government invited two wellknown experts on harbour works to give their advice as to the way, in which the harbour improvements should be carried out.

In connection with the plans and the advice of these experts the modern=ization of the principal Netherlands Indian ports has since been undertaken.

The scheme was mainly based on the following:

a. in a technical sense: to have basins, which at all times could accom=modate the latest ships, the dimensions of which for the time being were fixed as follows: 1000′ length, 100′ width and 40′ draught; quays with up to date facilities, warehouses directly connected with the railways, ordinary road and lighther transport; the timely securing of extensive fields for extension purposes and the housing of the harbour workmen and by applying the very best precautions from a hygienic and social point of view.

b. in a financial sense: the so=called productiveness principle, that is to say, that the port covers its own expenses without trying to make a profit, with this understanding however, that this principle, which in itself is very just, is not carried out so strictly, that the economic interests of the port in the hinterland can be damaged by it.

c. in an operating sense: the creation of a port authority, including all



BALINESE BRIDEGROOM

authorities connected with the port, which, as a central body, in the name of the Government, who remains the owner of the port and supplies all the capital, operates the port management in the widest sense, not losing sight at the same time of the fact, that the private initiative should be left a free hand as much as possible as to the running of the use of the port.

These objects have not yet been reached. As regards the technical claims, not one of the large ports is yet accessible to ships with a draught of 40 feet. Samarang even has no facilities yet for a direct connection of ships with the shore.

In view however of the present economic conditions, no new works will be started in the future in the large ports, except perhaps in Samarang. As regards the harbour management, in abeyance of the introduction of the semi autonomical harbour boards, a harbour director has been appointed temporarily in the different ports, assisted by an advisory board. It is however not yet certain, whether the proposed system of appointing harbour boards will be carried out.

According to the size of their imports and exports the Netherlands Indian ports are divided in:

a. large ports;
b. small industrial ports;
c. small ports.

Large ports, numbering seven, are considered:

Tandjong Priok (Batavia) Sourabaya (Tandjong Perak) Samarang Tjilatjap	Java
Belawan Deli (Medan) Emma Harbour (Padang)	Sumatra
Macassar	Celebes

Among the small industrial harbours are considered:

Batavia Cheribon, Tegal, Pekalongan Pasuruan, Probolinggo Banjuwangi Panarukan	Java
Bandjermasin	Borneo
Benkulen Sibolga Assahan Palembang	Sumatra



NATIONAL DRESS IN THE PADANG HIGHLANDS

Amboina	Amboina
Menado	Celebes
Benoa	Bali

There are more than 450 small harbours.

Description of the large harbours.

Tandjong Priok, harbour of Batavia. The Tandjong Priok harbour was constructed between the years 1877 to 1883.

Tandjong Priok, situated about 9 K.M. east of Batavia, consists of an outer port closed in by long sea piers with a water surface of 140 H.A. and three inner ports, of which the first one is 1.100 M. long and 185 M. wide, the second one 1 000 M. long and 150 M. wide and the third one about 1.000 M. long and 215 M. wide.

The channel in the outer harbour is 250 M. wide and has a depth of 9½ M. below low water mark. The first inner port is suitable for ships of 8½ M. draught, the second for ships of 9 M. draught, while the third inner port has been designed for ships of 12 M. draught. The Northern part of the Western board of the second harbour can be made accessible to ships of 12 M. draught by dredging it.

The inner ports all have quays with a large number of movable electrical cranes. Adjoining the quays are also the large modern warehouses of the port authority and those of private shipping companies.

Between the second and third inner port is a storage place for coal with powerful electrical coal heavers.

Besides these principal basins there are a few smaller ones, among others the one for the two dry docks, on the west side of the first inner port, while east of the third inner port, a fishing harbour is planned.

The whole port is connected by a system of canals with the chief shipping canal to Batavia sailed by the lighters. Batavia is furthermore connected with Tandjong Priok by a good ordinary road and a double railway track.

At the port are furthermore various installations for industries connected with shipping, while land has been reserved for the erection of other works and factories.

There is a flying station; besides there are native and European quarters.

Tandjong Priok is an entirely modern port, completely fitted out for the needs of modern shipping.

The harbour works, without depreciation, upkeep, railway construction and the works erected by private concerns, required up to the end of 1922 an expenditure of 51½ million guilders, while the expenditure for 1923 has been estimated at 4½ million guilders.



RAILWAY BRIDGE IN THE PREANGER

In 1922 4076 trading vessels with a tonnage af 3.902.475 net Reg. tons called at Tandjong Priok and 4097 with a tonnage of 3.918.022 tons sailed.

The total Customhouse receipts amounted to glds. 19.588.291.

By Customhouse receipts are understood, the import and export duties, duty on spirits (only for Batavia, Sourabaya and Samarang) and the duties on petroleum, matches and miscellaneous.

The port of Sourabava.

Sourabaya has a very good roadstead, protected by the island of Madura, while the Kali Mas, one of the mouths of the Brantas River, affords every facility for transportation by water, right into the heart of the city.

Until recently the ships anchored in the roadstead, while the discharging and loading was done by means of lighters (prahoes).

With the increasing growth of the commerce of Sourabaya, the principal sugar port of Java, the want of a direct connection between the ship and the shore was more and more felt.

On the west side of the mouth of the Kali Mas a complex of breakwaters or piers have been constructed, which enclose a harbour basin of about 80 H.A. Of the North breakwater, the outer quay is 1.200 M. long and shows 9 M. of water with low tide.

The inner quay has a length of 800 M. with also 9 M. of water with low tide.

Alongside the west pier of the basin, a wharf of 920 M. length has been constructed (Coal or Genoa Quay), while the Holland pier, built out in the basin which will be completed in 1924 or the beginning of 1925, will offer a space of 1.650 M. length. The depth alongside these quays is respectively 10 and 12 M. For the time being however, only ships up to 8 M. draught can reach the port once every twenty four hours (through the Westgate). The eastern part of the basin is fitted up as a port for prahoes (lighters). Furthermore in the north eastern corner a harbour has been reserved for the three floating docks of 14.000 tons, 3.500 and 1.400 ton capacity.

For the tankers of the Standard Oil Company of New York a wharf has been built north of the Genoa quay, near the mouth of the harbour basin.

On the west side of the west border of the harbour basin a new shipping canal has been dug, the Kali Perak, while the Kali Mas has been improved as much as possible, by broadening it and by the construction of stone walls alongside the banks.

Also this port is fitted up with all mechanical contrivances and other installations, which are required in modern harbours. All quays and warehouses are connected by direct wide roads and railways with the industrial centres in the hinterland.

From 1912 to the end of 1922 glds. 53 2/3 million has been spent on the



NATIVE ORCHEST

harbour works, not counting the construction of railroads and the expendi= ture by private concerns, whilethe expenses for 1923 are estimated at about 7 million gulders.

In 1922 7.538 trading vessels called at Sourabaya with a tonnage of 3.482.333 R.T. and 7.537 trading vessels sailed with a tonnage of 3.480.213 R.T.

The total Customhouse receipts amounted to glds. 23.735.802.

The port of Samarang.

Samarang only has an open roadstead for seagoing vessels, where the weather can be so boisterous during the west monsoon, that the discharging of the goods in the lighters is only possible on the leeside of the ships, while often the traffic with the shore has to be suspended altogether.

Plans for the construction of a protected harbour for ocean ships are projected and a few preliminary measures have been taken, but in view of the high expenses of such a seaport and the unfavourable financial and other conditions, these plans have not been carried out yet.

Also the lighter traffic experienced difficulties in the too narrow harbour channel. Therefore it was decided in 1910 to construct a harbour for the lighters.

This new harbour construction with a surface of 13 H.A. is situated on the east side of the harbour channel, the western pierhead of which was extended to 1.600 M. in sea, so as to prevent the mouth from silting up and to be able to keep up a greater depth.

The lighter harbour has a broad front, branching to the shore in two customhouse basins and a fishing harbour. This port and the customhouse basins are protected over a total length of nearly 1.400 M. When these basins, owing to the increased lighter traffic became congested, another basin was dug.

A small dry dock and two stationary steam cranes with a lifting power of 10 and 25 tons, also a few small hand cranes and eight electrical cranes of 1 ½ to 5 ton capacity belong to the outfit of the port.

There is sufficient warehouse space at the port, while excellent connections by road and rail with the hinterland exist.

The shipping traffic of Samarang during 1922 consisted of:

2.317 arrivals of trading vessels with a tonnage of 3.261.132 R.T. and

2.319 sailings of trading vessels with a tonnage of 3.261.485 R.T.

The value of the imports and exports amounted to:

Imports glds. 131.921.901, Exports glds. 109.246.154.

The total Customhouse revenue was glds. 11.900.692.

The port of Tjilatjap.

This port is the most favoured by nature of all the harbours in Java. Tjilatjap is situated on a small peninsula bordered on the east side by the Indian Ocean and on the west side by the Donan river. The mouth of this river, which has an entrance of such depth, that ships of 7 M. draught can enter at all times and those of 8 M. draught at high tide, offers a perfectly safe anchorage against the swell of the Indian Ocean, protected as it is by the Island of Nusa Kambangan lying opposite.

The hinterland of Tjilatjap also is not without importance. In spite of all these favourable conditions, owing to its isolated position on the South Coast of Java, outside the ordinary shipping routes, this port has not reached the same prosperity as the ports on the North coast, described above, though a slow development has been noticeable.

About 1910 renewals and extension works were started here also.

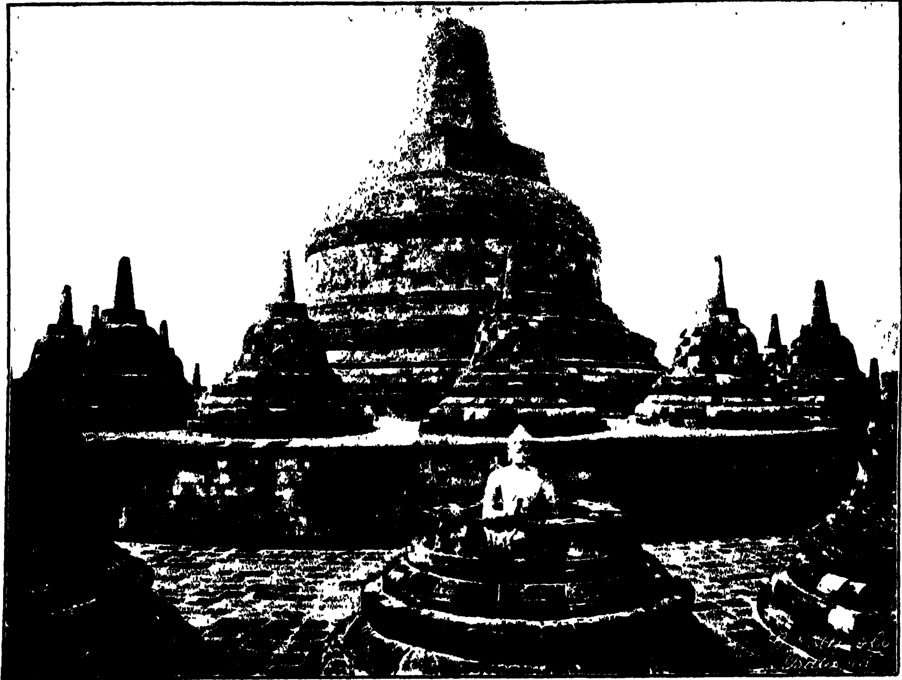
At present the port has two concrete wharves of respectively 408 M. and 120 M. affording a mooring place for ships of 7 M. and 8 M. draught.

The dredging of the entrance to obtain a depth of 9 M. below low tide, a work, that is connected with the improvement of the harbour of Tjilatjap, was taken in hand, but was stopped in 1921 in connection with the economies, that had to be enforced owing to bad times.

By a side line to Maos, Tjilatjap is connected with the railway system of Java.

In 1922 133 ships with a total tonnage of 317.920 R.T. called at Tjilatjap, while 134 ships sailed from there with a total tonnage of 317.765 R.T.

The Customhouse revenue was glds. 291.170.



THE TOP OF THE BOROBUDUR. TERRACES WITH STUPAS

The port of Macassar.

Macassar is by its geographical position the natural stapleport of the eastern part of the Archipelago.

It has a roadstead which is partly protected by a number of coral islands.

Until a short while ago, Macassar only possessed a wharf on screwpiles of 500 M. length and 10 M. width, running parallel with the shore, which was connected by footbridges with the shore. From 1912 to 1918 considerable improvements have been carried out however, consisting of a caisson quay of 1.340 M. length, built out in the sea, offering to the ships a depth of 9 to 10 M. with low tide.

Behind this quay, on the south end of same, a harbour for lighters with a length of 280 M., and a waterdepth of 3 M. was constructed.

To the north of the quay, land has been banked in, intended for the storage of coal and petroleum.

For the protection of the quay, a breakwater has been constructed over the coral islands and the banks in front of the roadstead.

The figures for the traffic of Macassar for 1922 are:

Arrivals of steamers 4.542; tonnage 1.308.481 R.T.

Sailings 4.538; tonnage 1.307.421 R.T.

The total Customhouse revenue was glds. 3.126.372.

The port of Padang. (Emma Harbour).

Emma Harbour was constructed in the years 1880 — '90 in the northern half of the Queen's Bay, on the West Coast of Sumatra, in the first place with the purpose to create an opportunity for the shipping of Ombilin coal and only in the second place as a harbour for Padang.

By two breakwaters, of which one, 900 M. long, has been constructed sticking out perpendicularly on the coast in the sea and the other one of 260 M. length, parallel with the coast across a coral bank, a harbour surface of about 1 $K.M.^2$ has been formed.

There is 9.30 M. water in front of the landing stages at low tide.

A start was made in 1919 to deepen the approach to the harbour to 9.50 M., but the work was suspended in the beginning of 1921, owing to bad times.

There are four screwpile wharves with a total length of 433 M. for the mooring of steamers. Furthermore there is a coal wharf, a salt wharf, a petro= leum wharf and a dynamite wharf.

Emma Harbour is well fitted up for loading and discharging of coal. The outfit consists of:

a. a coal shoot with a capacity of 300 tons per hour.

b. two electric coal conveyers each with a capacity of 120 tons per hour.

c a floating coal conveyer with a capacity of practically 40 tons per hour.

By the alteration of the route of the passengers steamers of the Rotterdam Lloyd, which formerly used to call at Emma Harbour on the outward as well as on the homeward journey, to the Straits of Malacca, this harbour has suf= fered a severe loss indeed, though the goods traffic will not become less for it.

In 1922 the number of arrivals of ships amounted to 1813 with a tonnage of 859.364 R.T. and the number of sailings was 1807 with a tonnage of 856.891 R. T.

The Customhouse at Emma Harbour collected during 1922 in import duties glds. 1.605.030, in export duties glds. 241.660. The total revenue amounted to glds. 2.596.288.

The port of Belawan (Deli).

The enormous strides, which the development of Sumatra's East Coast took on account of the fast extension and growth of the estates in this districts, led to the construction of a harbour at the mouth of the deep Belawan River on the island of the same name.

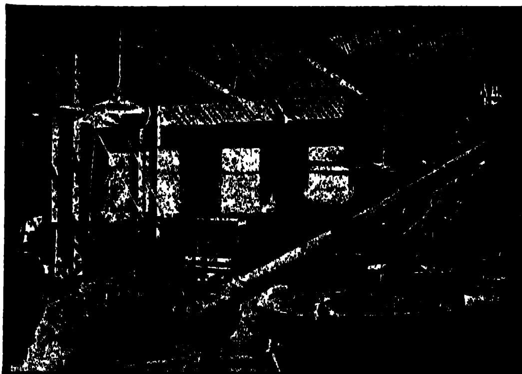
This harbour was however greatly handicapped by the bank at the entrance of the river. In connection with the great need of a good connection by large ocean steamers, powerful dredgers were stationed there to make a deep channel and keep this up.

Belawan has at present a wharf of 740 M. length at the old coastal establishment, while the coastal establishment has a wharf of 181 M. length



HOUSES FLOATING ON THE WATER AT BANDJERMASIN. SOUTH BORNEO.

accessible to ships with a draught of 8 M., furthermore two coaling wharves, each 30 M. long. Besides these there is a separate basin, the socalled coconut leaf harbour for the native sailing smacks, which land the large parcels of coconut leaves, required for the tobacco sheds and other buildings on the estates. The latest impro=vement is the construction of a quay of 930 M. length, with sheds be=hind, for large ocean stea=mers with a draught of 12 M. at low tide. The harbour is connected by an ordinary road and by a railway with the interior. The approach to the river and the river itself are conti=nuously dred=ged, so as to keep the depth on the same level. At present there is a minimum depth of 7.30 M. at low tide over a width of 60 M. in the channel, so that ships of 7 M. draught can be accommodated at all times and ships of 8½ M. draught can enter the port at the daily high tide.


FACTORY OF ESSENTIAL OILS

The number and the tonnage of the ships, which arrived at Belawan in 1922 and sailed from there amounted to: arrivals 2.084, tonnage 1.265.018 R.T. sailings 2.101. tonnage 1.274.205 R.T.

The Customhouse receipts amounted to a total of glds. 4.547.530.

Of the other fairly important ports of the Dutch East Indies, *Sabang* occupies a special place, in connection with the purpose, for which it was constructed.

The extremely favourable situation of Sabang, on the Island of Pulu Weh, close to the north entrance of the Straits of Malacca, on the large navigation routes to the countries of East Asia and the Western territory of the Pacific Ocean, makes Sabang an ideal coaling station.

The harbour itself is a naturally protected small bay with a water surface of about 1.35 $K.M^2$., with a favourable depth up to the coast and a good anchorage. The harbour has excellent facilities for bunkering coal by five elec=trical movable portal=cranes and a bunker lighter with a capacity of 300 tons per hour.

Besides there is a small dry dock of 2.600 tons capacity, which in a short time will be replaced by one of 5.000 tons, also slipways for the construction of small ships and lighters up to 1.000 tons.

The harbour is managed by the „Sabang Bay Harbour and Coaling Station Ltd.", in which the Government is interested for a considerable amount.

The traffic in 1922 amounted to:

Arrivals of trading vessels 632, tonnage 1.321.909 R.T.

Sailings of trading vessels 633, tonnage 1.321.909 R. T.

In Java, *Cheribon* and *Banjuwangi* are important seaports, the first for sugar and the latter for products from Java's East Corner, such as sugar, copra, coffee and tobacco. Both ports have open roadsteads and lighter ports with quays and warehouses.

Also *Probolinggo, Pasuruan, Pekalongan* and *Tegal* are ports of importance.



THE WATER FRONT WITH HARBOUR MASTER'S OFFICE AT TANDJONG PERAK

Amboina, situated on the island of the same name, is the place, where for centuries the commercial life of the Moluccas has been concentrated. The harbour is a very beautiful, naturally protected basin on the shore end of the Ambon Bay. The roadstead of Ambon is 12 to 19 fathoms deep. There is a concrete wharf and plenty of space for warehouses.

Menado is the port of the Northern Peninsula of Celebes and the Sangir and Talaud groups of islands. It is situated on a bay at the mouth of the Menado river and has a considerable export of copra and coffee. In the Menado river an obstructive sandbank has been formed which however is dredged regularly.

Balik-Papan, Bandjermasin and *Pontianak* are the important ports of Borneo.

Balik-Papan, situated on an arm of the sea, running deep inland, is the petroleum harbour for the important petroleum fields of the Royal Dutch on the large island.

Bandjermasin, situated on the Barituriver at 30 K.M. from the mouth, is the central collecting station of the enormous territory of this large river with its branches.

The place is accessible to large ocean steamers and has a considerable export of timber, jungle products and coal.

Pontianak is situated 19 K. M. from the sea on one of the delta branches of the large Kapuas river, which practically covers the whole Residency Western Districts of Borneo.

The harbour installation of Pontianak consists of a wooden wharf of 300 M. length, where large ocean steamers can moor.

The exports from Pontianak are similar to those from Bandjermasin.

Palembang is the port of South East Sumatra. It lies 90 K.M. from the coast on the broad Musi River and is accessible, to large ocean steamers. The landingstage on screwpiles of 250 M. length is connected by 3 bridges with the shore. The depth of the water at the wharf is about 6 M. at low tide. Besides this wharf with the installations behind it, Palembang has several large and small mooring places. Palembang is a very important place with a very promising future. In the neighbourhood is found the most important petroleum centre in Sumatra of the Royal Dutch Petroleum Company, also the newly opened Bukit Asem (Lematang) coal mines of the Government . At the same time, it is the terminus of the main line of the growing railway system of South Sumatra.



SOURABAYA. THE ROAD

At the junction of the branch river Ogan with the Musi at the terminus of the railway, a wharf has been constructed for ocean steamers, which makes it possible to load the goods carried by the railway direct into the steamers. Next to it is a coal shoot for the handling of the Lematang coal.

Management and operation of the ports.

The operation of the ports of the Dutch East Indies must be carried out in such a way, that besides the costs of administration, also the interest and the paying off of the capital, invested in the harbour works, are earned.

As much as possible is left to the private initiative.

The Harbour Board itself has only a small part of the quays with the land and warehouses lying behind in its own management, just enough to be able to have a say in the manipulation of goods in the harbour and the fixing of tariffs and to prevent the forming of a trust.

A few branches have therefore been monopolized, such as the mechanical outfit of the normal types, the supply of water and electricity.

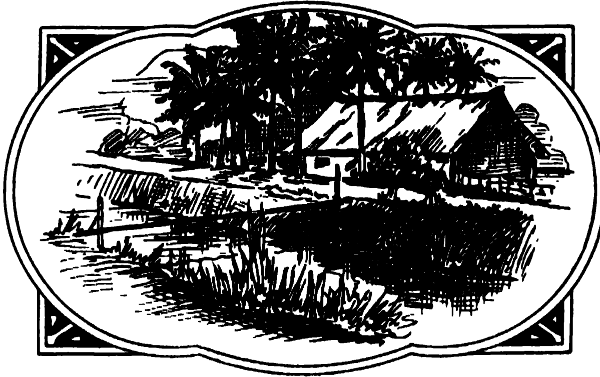
The harbour is managed by a Director, by preference an engineer, with an operative, administrative and technical staff.

Besides the Managing Board, an Advisory Board is appointed in each port to give advice to the Director. This committee is an advisory body, which must be consulted by the Director of the Harbour, who is at the same time

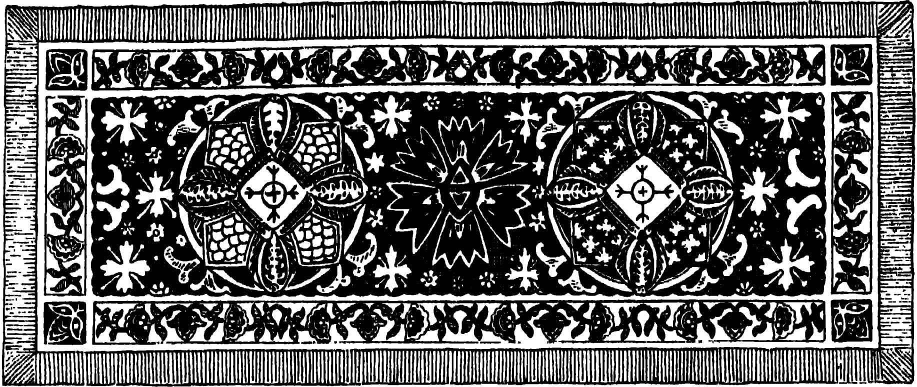
its chairman, but which also, on its own account, may announce its wishes and recommend measures or steps to be taken.

In the Committee, the constitution of which varies with local conditions, all parties interested in the harbour are represented as much as possible.

The Harbour Service resorts under the Department of Public Works, the Head of which is the highest authority with regard to harbour matters.

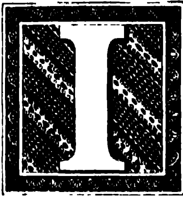


SHIPPING.



CHAPTER XIV.

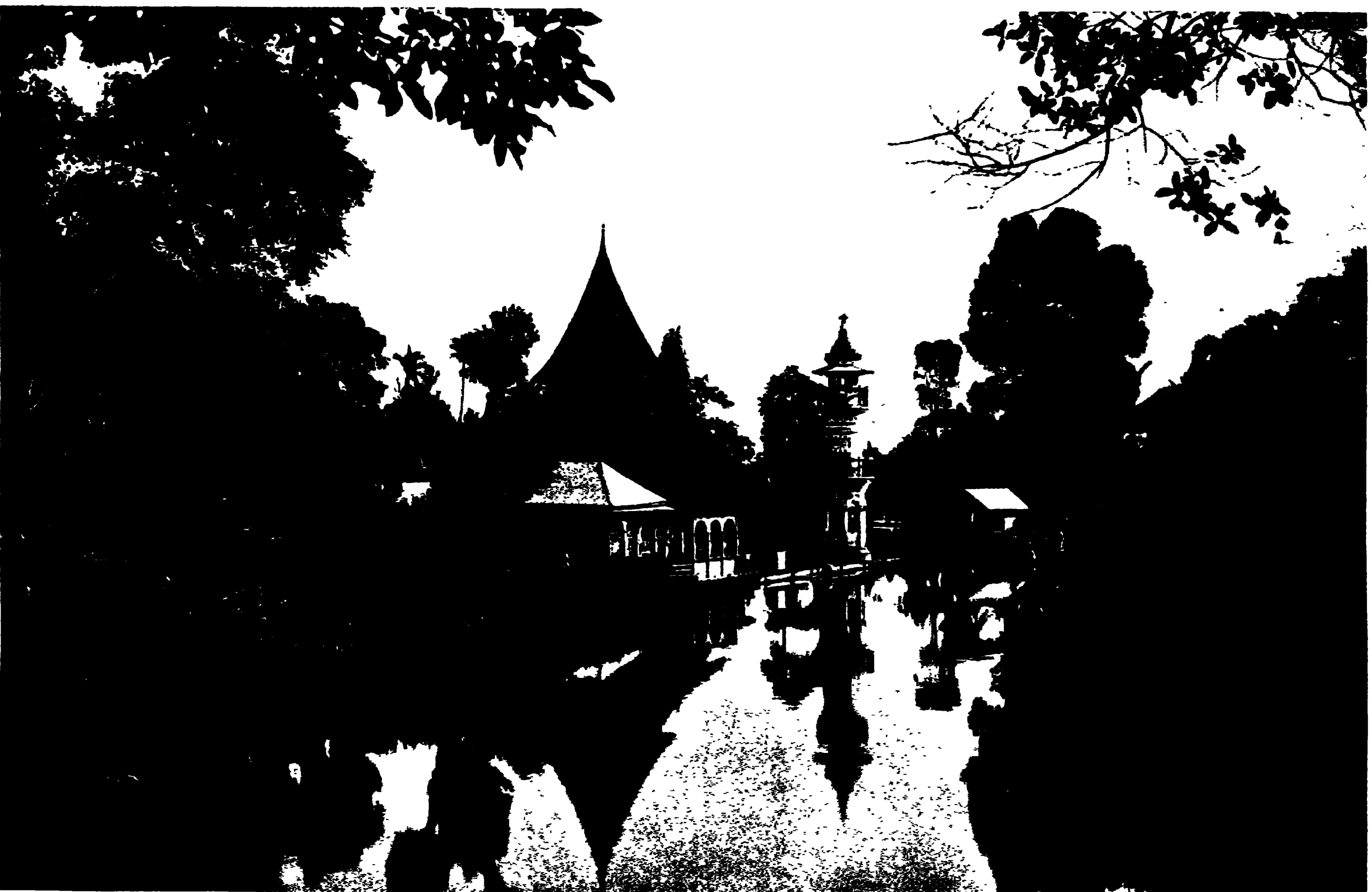
SHIPPING.



In an Archipelago as the Dutch East Indian, the traffic by water has naturally always been of great extent. In bygone days this was chiefly done by sailing boats, which extended their trips far outside the group of islands, until about 1850 the first steamships appeared in the Indian waters, the traffic by larger and faster steamers gradually incre=ased and the need was urgently felt for reliable sea charts and descriptions of the routes to be navigated, in which, as in all tropical waters, numerous reefs and shallows are found, making navigation without good charts exceedingly dangerous for bigger and faster ships.

For this reason in 1870 the trigonometrical survey of the seas in the Archipelago was seriously taken in hand and vigorously carried on during the following years. The results of these hydrographical surveys, in which recently, besides the Royal Navy, also the Civil Navy takes part, have been registered in 357 sea charts with accessory descriptions, which come up to the highest requirements and guarantee a safe navigation in the Indian waters. The greater part of the seas has now been mapped out, but it will last some time before the trigonometrical survey of the remotest corners has been completed.

Besides these excellent sea charts, 140 coast lights, 60 lighted buoys, 110 floating lights and 770 beacons ensure a safe navigation. By replacing the oil=burners with wicks of the coast lights, by acetylene or petroleum incandescent light and by introduction of revolving and flash lights, the coast lighting has been modernized during the last fifteen years. By systematic observations of the visibility of the coast lights in these regions, which proved that the atmospheric conditions for it were favourable, the Lighthouse Service of the



MOSQUE AT FORT DE KOCK (SUMATRA)

Marine Department succeeded, with very little expenses, in making the coast lighting one of the best in the whole of Asia.

For the navigation in dangerous waters, which are subject to changes, and for the entering and the leaving of ports, Government pilot services have been established in Batavia, Sourabaya, Tjilatjap, Emma Harbour, Palembang, Belawan, Arubay, Sambu, Balik Papan, Samarinda, Tarakan and Macassar. The wireless stations Malabar (Bandung), Weltevreden and Sourabaya give daily time-signals, so as to enable ships to verify their chronometres. The two latter stations and those of Sabang, Kupang, Ambon, Balik Papan and Tarakan are opened for wireless communication with ships at sea; the building of other stations is in course of preparation.



HARVESTING COCOA FRUITS

The importance of the Dutch East Indies as a country of export of numerous products such as sugar, copra, petroleum, vegetable oils, cinchona, tobacco, coffee and tea has gradually increased during the last fifty years and also the import of the articles required for the estates, industry and for the population in general; consequently the oversea and local navigation extended gradually.

The shipping traffic in the Archipelago is mainly provided for by the Royal Packet Navigation Company, while various Dutch Companies keep up a regular passenger and freight service with Holland, Europe, Asia and the U. S. A.. Besides, several foreign lines, especially British, Japanese, American, Scandinavian and German run cargo steamers (a few with passengers accommodation) to the D.E.I. Archipelago. The following table which is based on the Statistics of Shipping in the Dutch East Indies, published by the Shipping Branch of the Marine Department, gives an interesting scope over 1922 of the arrivals and the sailings in the D.E.I. of ships and vessels in the oversea and local traffic.

By oversea traffic is understood the direct arrivals from, or direct sailings to a port outside the D. E. I., while under *a*) are mentioned ships of a net tonnage of 300 M^3 (1 M^3 = 0.353.357 R.T.) and above, under *b*) ships of less than 300 M^3 net tonnage.

		OVERSEA TRAFFIC				LOCAL TRAFFIC				TOTAL			
		ARRIVALS		SAILINGS		ARRIVALS		SAILINGS		ARRIVALS		SAILINGS	
		NUMBER	N. R. T.	NUMBER	N. R. T.	NUMBER	N. R. T.	NUMBER	N. R. T.	NUMBER	N. R. T.	NUMBER	N. R. T.
Trading vessels.													
Total of steamers, motorships, sailing ships	a.	4.405	5.357.952	3.961	5.308.836	20.694	29.472.447	21.132	29.538.878	25.099	34.830.399	25.093	34.847.714
	b.	12.933	431.449	9.823	333.922	69.699	985.866	72.809	1.082.332	82.632	1.417.315	82.632	1.416.254
Total		17.338	5.789.401	13.784	5.642.758	90.393	30.458.313	93.941	30.621.210	107.731	36.247.714	107.725	36.263.968
Under Dutch flag	a.	1.997	2.640.637	1.937	2.633.216	17.853	23.902.128	17.903	23.892.586	19.850	26.542.764	19.840	26.525.450
	b.	1.348	32.155	1.255	28.976	65.923	803.887	66.035	806.361	67.271	836.043	67.290	835.689
Total		3.345	2.672.792	3.192	2 662.192	83.776	24.706.015	83 938	24.698 947	87.121	27.378 807	87 130	27.361.139
Under foreign flag	a.	2.408	2.717.315	2.024	2.675.619	2.841	5.570.320	3.229	5.646.645	5.249	8.287.635	5.253	8.322.264
	b.	11.585	399.294	8.568	304.947	3.776	181.978	6.774	275.618	15.361	581.272	15.342	580.565
Total		13.993	3.116 609	10.592	2.950.566	6.617	5.752.298	10.003	5 922.263	20.610	8.868.907	20.595	8.902.829

The share, which the principal foreign flags had in the oversea traffic, was respectively:

	ARRIVALS N.R.T.	SAILINGS N.R.T.
Holland	2.648.411	2.639.577
Great Britain	1.725.442	1.715.548
Japan	370.318	374.912
U. S. A.	216.961	217.315
Norway	100.707	96.820
Germany	88.339	91.873
Denmark	77.385	80.565
Sweden	72.792	72.792

A survey over 3 years of the oversea shipping traffic, compared with the corresponding figures for 1913, is given in the table below, which shows the tonnage employed during the last three years for the oversea traffic and the share which Holland, Great Britain, Japan, the U.S.A. and Germany had respectively:

YEAR	TONNAGE IN N.R.T. EMPLOYED IN THE OVERSEA TRAFFIC.	DUTCH FLAG. IN N.R.T	BRITISH FLAG IN N.R.T.	JAPANESE FLAG. IN N.R T.	AMER. FLAG. IN N.R.T.	GERMAN FLAG. IN N.R.T.
1913	5.363.959	2.065.372	2.247.704	187.986	—.—	622.615
1920	5.151.945	2.173.148	1.698.234	616.608	276.325	7.420
1921	5.689.048	2.544.170	1.901.061	576.325	253.004	30.389
1922	5.717.316	2.667.845	1.927.209	372.438	216.961	90.106

From this it appears that at present the Dutch and D.E. Indian trading fleet supplies about half the tonnage required for the oversea traffic. About fifty per cent of the available tonnage under Dutch Flag, amounting to round about 2.410.000 Gross Registred Tons, is now employed in the regular service to and from these countries. The above said table shows that shipping under Dutch flag has increased regularly since 1919, while the American flag, which was only rarely seen here up to 1917, has been seen more frequently since. The revival of German shipping deserves attention, also the decrease in Japanese shipping.



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The principal ports of the D. E. I. are given in the table below, mentioning the net tonnage of arrivals and sailings in 1922.

	PORTS	ARRIVALS IN N.R.T.	SAILINGS IN N.R.T.
Java:	Tg. Priok	3.902.475	3.918.022
	Sourabaya	3.482.333	3.480.213
	Samarang	3.261.132	3.261.485
	Cheribon	1.658.304	1.658.304
Sumatra:	Padang	859.364	856.891
	Sabang	1.321.909	1.321.909
	Belawan (Deli)	1.265.018	1.274.205
	Sambu	1.502.121	1.505.654
Borneo:	Balik Papan	1.049.824	1.051.237
	Tarakan	356.891	364.311
Celebes:	Macassar	1.329.682	1.307.421
	Menado	341.696	339.223

It is of great importance for shipping that docks and repair installations are available in the various ports. These are found in:

Sabang (Sabang Company, floating dock of 4.000 tons capacity).

Tandjong Priok (Tandjong Priok Dry Dock Company, floating docks of 4.000 and 8.000 tons capacity and a slip of 2.000 tons).

Sourabaya (Sourabaya Dry Dock Company, floating docks of 14.000 and 2.000 tons; Navy ship yard with floating docks of 1.400 and 5.000 tons capacity).

There are facilities for the repairing and docking of smaller ships in several of the other places.

Bunker coals can be obtained at Tandjong Priok, Sourabaya, Tjilatjap, Sabang, Padang (Emma Harbour), Palembang, Macassar and Stagen (Pulu Laut). In Sabang, Emma Harbour, Tandjong Priok, Stagen and Palembang are coal conveyers and floating bunker installations to expedite the coaling; in Sourabaya is a steam crane and a floating bunker installation. Elsewhere the coaling is done by hand.

In Sabang (Sabang Bay Harbour and Coaling Station Ltd.) are always considerable stocks of Ombilin, Natal and Cardiff coal; in Emma Harbour, Ombilin coal from the Ombilin mines; at Palembang, Bukit Asem coal from the Government coal mines near Muara Enim. The Netherlands Indian Coal Trading Company keeps large stocks of Australian coal at Tandjong Priok, Sourabaya, Tjilatjap and Macassar and at the first two mentioned places generally also Japanese and Cardiff coal. Stagen is the shipping port of the Pulu Laut mines, which are worked by the Government.



BATIK INDUSTRY

Fuel oil and Diesel oil are obtainable at Balik Papan, Batavia (Tandjong Priok), Bule Bay (Ceram), Macassar, Palembang, Pangkalan Brandan, Pulu Sambu, Sabang, Sourabaya and Tarakan, where the Asiatic Petroleum Com= pany, an affiliated company of the Royal Dutch, has tank installations.

A few details of the shipping companies under Dutch flag, which ply in and on the Dutch East Indies may follow here.

The Royal Packet Navigation Company (*Koninklijke Paketvaart Mij.*).

A regular shipping connection between the various parts of the Archipelago is necessary for the good administration as well as for the economic develop= ment of these districts. The Government also realized this fact and has always tried to provide for it. In previous years the upkeep of certain shipping connections and the carrying of the mail was put out by public contract and this contract was held for a long time by the Netherlands Indian Steamship Company working with British capital. In 1888 negotiations were opened with a Dutch concern for the entering into a contract to keep up a shipping service in the Archipelago for the years 1891 — 1895, which led to a contract being closed with the Directors of the „Netherland S.S. Coy." and the „Rotterdam Lloyd S.S. Coy." and the foundation of the „Royal Packet Navigation Company"; this agreement has since been renewed. It stipulates among other things, that the mail has to be carried on the lines of the Company

at a fixed remuneration, while the Government engaged itself to transport Government passengers, goods and money by the ships of the Royal Packet Navigation Company. On the other hand the Company is under obligation to maintain a regular service on 30 lines, with fixed sailing dates, while also certain stipulations are made regarding the minimum number of passengers and freight, which the ships, running on certain lines, must be able to carry. Furthermore the Royal Packet Navigation Company keeps up various services not contracted for, among which some foreign services, such as the Java-Australia Line, the Java-Siam Line, the China Line, the Deli-Rangoon Line and various other irregular services.

A monthly service is maintained from Batavia, via Samarang, Sourabaya, Macassar to Brisbane, Sydney, Melbourne and vice versa by steamers of 5.000 Gross R. T., with accommodation for 100 passengers. The China service is a fortnightly one, from Belawan (Deli), via Penang, Singapore to Hongkong, Amoy and Swatow. On the Deli-Rangoon and the Java-Siam Line respectively 19 and 17 journeys were completed in 1922. The extent of the traffic is reflected in the number of miles navigated per year; in 1922 the ships of the Royal Packet Navigation Company covered 2.916.000 naut. miles in the Archipelago and 42.400 naut. miles outside it, while 736.000 passengers were carried.

A large fleet is required for such an extensive traffic; at the end of 1922 the fleet consisted of 65 passengers and 41 freight boats and one salvage steamer or a total of 107 steamers, measuring 206.000 Gross R.T. and 122.000 Net R.T. Ten of these steamers have a gross tonnage varying between 4.500 and 5.700 Gross R. T. For the upkeep and operation of this fleet, four stern wheel steamers and several harbour vessels, the Company has at Tandjong Priok extensive workshops and warehouses, its own laundry, ice and aerated water factory, a refrigerating installation and at Batavia a hotel and a hospital for the staff. Ashore the monumental office building bears witness of the prosperity of the company. An own coal mine at Berau (Borneo) meets, to a large extent, the wants of bunker coal.

The Netherland Steamship Company.

The company owns a fleet, composed of 8 mail steamers and 43 cargo steamers, measuring together 350.000 Gross R.T. with a total carrying capacity of 473.000 tons.

The mail steamers, of which the largest measure about 11.000 gross R.T. keep up a fortnightly passenger's service between Holland and the D.E.I., following the route Amsterdam, Southampton, Algiers, Genoa, Port Said, Suez, Colombo, Sabang, Belawan (Deli), Singapore, Batavia, Samarang, Sourabaya and vice versa.

Besides this, there is a regular cargo service between Holland and the East Indies, whereby in the Archipelago besides Batavia, Sourabaya, Samarang, Belawan (Deli) and Sabang, which are already touched by the mail steamers,



K. P. M. STEAMERS AT BANDJERMASIN

many other ports such as Cheribon, Tegal, Pekalongan, Pasuruan, Probolinggo, Panarukan, Banjuwangi, Tjilatjap, Telok Betong, Padang, Palembang, Balik=Papan, Menado and Macassar are touched.

Furthermore the Company, in combination with the Rotterdam Lloyd and the Java=China=Japan Line, keeps up the Java=Pacific Line from Java's North=coast ports, via Macassar, Balik=Papan, Manilla to San Francisco, Portland, Vancouver. On the home trip Yokohama, Kobe, Shanghai and Hongkong are also touched.

In combination with the Rotterdam Lloyd, the Holland=America Line and the Ocean Steamship Company, the Java=New York Line is run from Java via Mediterranean ports to New York, while together with the Rotterdam Lloyd, the Java=Bengal Line is run between Java, Rangoon and Calcutta.

The Rotterdam Lloyd.

The fleet of this company is composed of 11 mail and 36 cargo steamers, measuring together 304.000 Gross R. T. with a total carrying capacity of 414.000 tons. The mail steamers, of which the largest measure about 11.000 Gross R.T., keep up a fortnightly passenger service between Rotterdam and Java along about the same route as the Nederland Steamship Company.

Both companies together keep up a weekly service between Holland and the D. E. Indies.

The cargo steamers also follow the same routes as those of the Netherland S. S. Coy. Besides the Rotterdam Lloyd takes part in the Java=Pacific, the Java=New York and the Java=Bengal Line.

The Java=China=Japan Line.

The Company owns a fleet of fifteen steamers with passengers accom=modation, measuring together 99.000 Gross R. T. The Coy. keeps up the following regular services:

The Java=China Line between Java, Hongkong, Amoy, Shanghai, Ching Wang Tao, Dalny and vice versa via Hongkong to Java.

The Java=Japan Line between Java, Macassar, Balik Papan, Hongkong, Shanghai, Yokohama, Nagoya, Osaka, Kobe and vice versa to Java via Amoy and Hongkong.

The Java=South China Line between Java, Hongkong and Saigon.

The Java Pacific Line in combination with the Rotterdam Lloyd and the Netherland S. S. Company. The route has already been described above.

Among the steamship companies under Dutch Flag should be mentioned the Steamship Company „Ocean" owning five steamers, measuring together 30.000 Gross R.T., which keep up a freight service between the D. E. I., Liverpool, Amsterdam and other European ports. The Company is closely connected with the British owned Ocean Steamship Company Ltd. and the China Mutual Steam Navigation Company Ltd.

The principal steamship companies under foreign flag, which keep up a regular service with the D.E.I. are:

under British Flag:

The Ocean Steamship Coy and the China Mutual Steam Navigation Company with Europe and East Asia;

the British India Steam Navigation Company and the Asiatic S. S. Coy with British India;

the Burns Philp Line, the West Australian Joint Service and the Commonwealth Government Line of Steamers between Java and Australia.

Under American Flag:

the U.S.A. Shipping Board, the Kerr Line and the Istmian S. S. Lines with U.S.A.

Under German Flag:

the Deutsch Australische Dampfschiffs Gesellschaft with Europe and Australia.

Under Japanese Flag:

the Osaka Shosen Kaisha, the Nanyo Shosen Kaisha, the Toyo Kishen Kaisha, the Nippon Yusen Kaisha and the Kokusai Kisen Kaisha.

The Swedish Rederi Aktie Bolaget Transatlantic, the Norwegian Norske Afrika og Australie and the Danish Ostasiatische Kompagni to Northern Europe.

For Government purposes serves the Civil Navy, consisting of 25 sea-going vessels, varying between 400 and 1.000 tons displacement, totalling about 18.000 tons, which all are fit for the carrying of Government officers, Government goods and money and for police supervision in the territorial waters and other similar services. These ships, partly fitted out with wireless telegraphy, are spread over the whole Archipelago and are mostly, just as the District boats, at the disposal of the Heads of the District Civil Service. These District boats (about 150 steamers and motor boats varying between 100 feet and 25 feet of length and 126 rowing boats) are used for local and river traffic.

For upkeep of the buoyage and coast lighting and the erection of coast lights, the Government owns four steamships and one motor boat of about 700 tons displacement each.

